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D.A.

THE HUNTERIAN ORATION,
PRESIDENTIAL ADDRESSES,
AND
PATHOLOGICAL & SURGICAL WRITINGS:

BY
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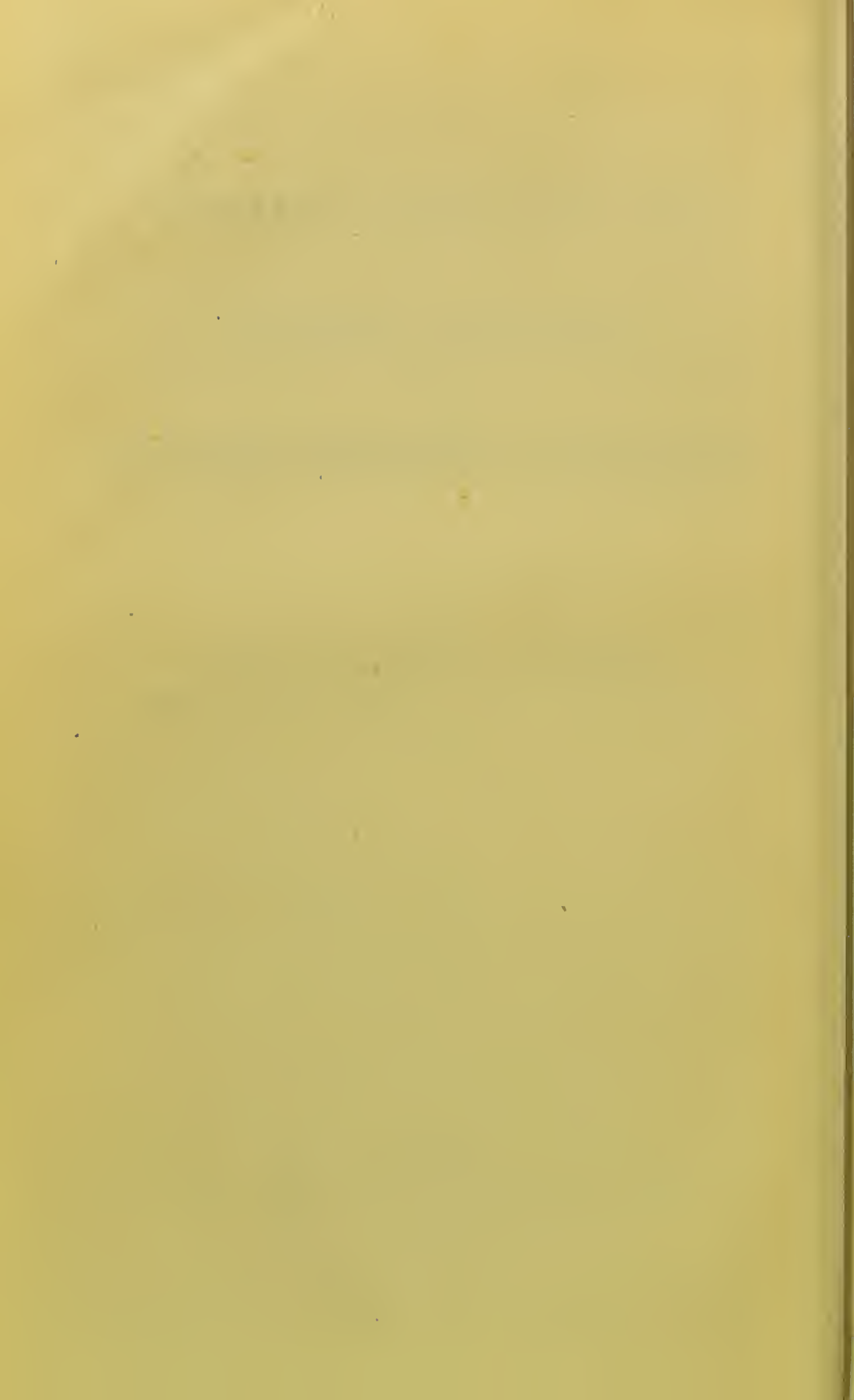
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LECTURES ON TUMOURS.

Delivered at St. George's Hospital, in 1837.

LECTURE I.

Definition of Tumour.—Modes of Formation.—Causes.—Inflammation of.—Destruction by Ligature of Vessels.—Rapidity of Growth.—Texture influenced by Situation.—Analogous and Heterologous Formations.—Physical Characters.—Malignancy.—Classification.

I HAVE now to bring under your consideration the subject of *Tumours*. But what, in surgical language, *is* a tumour? Strictly speaking, it may be, perhaps, defined as a new formation—an addition to some part of the body of a substance organized, or partly organized, and not the result of inflammation only. A tumour is not a mere swelling, you will observe, however large. I have seen the breast enlarged so as to weigh more than eleven pounds; but this is hypertrophy only. I have seen the serotum immensely enlarged; it has been removed, in fact, when of the weight of 100 lbs.; but this, too, is a kind of hypertrophy of the skin and subjacent textures. You may here see the tibia twice as large and thick as usual, but this growth is only the enlargement of inflammation; by the side of it is a preparation of the humerus, with some exostoses upon it. Now these, however small, constitute a form of tumour, according to the definition just given.

There is, however, a great difference in the mode in which tumours originate.

1. A tumour is, at one time, a *simple addition* to the original texture: such is sometimes a fatty tumour; such are some forms of exostoses, in which the natural bone is unaltered, and the new formation possesses the same structure nearly as the bone to which it is attached; such is sometimes a cancerous tumour, when attached to the side of the breast, or other organ. And these new formations, you will observe, may sometimes be similar, or at least analogous, to the tissue in which they arise—as the exostoses, or fatty tumour, to the natural bone, or fat—or they may be entirely dissimilar from every natural texture, and not present even an analogy in their structure to any normal part of the body; as in the instance of the cancerous tumour just alluded to. Hence arises the division which has been made, of new or accidental formations, into *analogous* or *heterologous* structures, according as they resemble or are unlike any of the natural textures of the body.

2ndly. A tumour is, at another time, the conversion of an original tissue, or structure, into a new one. A gland inflames, and is enlarged by the usual deposits of inflammation; it may, however, have a new action established in it, its natural textures may be absorbed, and a new substance deposited in their place, and it will then constitute a tumour; it may be of a carcinomatous nature, or a medullary structure, and so on. Such conversion of one substance into another is generally a change of the natural textures of the part into something not known before in any part of the body—*i. e.* the tumour formed by change of structure, instead of by simple addition, is generally, though not always, a heterologous tumour. You will perceive, moreover, that, commencing in this manner, a tumour may actually be less in size than the organ whose place it has usurped.

3rdly. A tumour may be formed thus: simple enlargement has taken place (in the breast, for instance), in consequence of inflammation; lymph has been organized, so as to leave a swelling for twenty years perhaps: then a new action ensues; there is a deposition of new structure, fungous or scirrhus, and it grows rapidly, and the mere *swelling* becomes a *tumour*.

Thus, then, a tumour may originate in three different ways, all differing from inflammation. This distinction was first made, I believe, by Mr. Abernethy, and it is of great importance in practice. For the most part, all simple enlargements, or mere swellings, are more or less under the control of remedial agents, and seldom require a surgical operation. A gentleman, for instance, under my care, had a swelling of the testis, which was at least eight inches long, ulcerated, and with large fungous projections, like those of a malignant disease: but by a course of mercury of six weeks' duration all this was cured. On the other hand, almost all new formations resist treatment, and most of them require the removal or destruction of the tumour.

Many speculations have been entered into with regard to the causes of the growth of tumours. Mr. Hunter and Mr. Abernethy supposed that they began by the organization of a clot of blood accidentally effused, or of lymph deposited by inflammation. A preparation is seen in the museum of the College of Surgeons, to show the first organization of a coagulum in this way; but it is to me any thing but satisfactory, and is probably a mistake altogether; and certainly there appears, in the majority of cases, no proof of either circumstance, and in many the tumour has clearly not originated in these ways. With regard to the organized lymph as a cause of tumours, we see constantly the thickening around the joint, or the hardness in the breast, produced by lymph, but it is only now and then that a tumour originates in this thickened part. It has been well remarked by Mr. Lawrence, that if the conversion of either blood or lymph were

the general cause of tumour, we ought to be able to see its several stages ; whereas a tumour of the size of a pea is as distinct and well defined, in many cases, as one of 20lbs. weight. Something more, then, is necessary to make the organized lymph a tumour, and we are, for the most part, ignorant of the ultimate cause of their growth, whether it be in the state of the part or the condition of the general system.

Inflammation is, in fact, an occasional cause only of the growth of a tumour ; and the effects of inflammation are a kind of excitant : a tumour grows in the inflamed part from some peculiarity (generally a constitutional peculiarity) ; and the inflamed and thickened texture is selected for the situation of the tumour, as the weakest ; just as if a tendency to ulceration is induced by depression of the constitution, a cicatrix, or other newly formed part, will usually be the seat of the ulceration.

Sir Everard Home imagined that an injury was always the cause of the growth of tumours ; in which injury there was an action more than enough to repair the injury. But an injury, also, is only an occasional cause. A person received a blow on the femur, and this cartilaginous exostosis was the result ; but a hundred other persons would only have inflammation established by the blow. A groom, in catching a horse, ruptured a few fibres of the pectoral muscle, and this large tumour of fungous hæmatodes appeared in the part in a short time ; but how many persons will rupture their muscles without any such consequence ?

Although, then, inflammation, or an injury, will now and then be a local cause for the formation of a tumour, yet, in the greater number of cases, with all the fondness of our patients for assigning a reason for their diseases, no evident cause can be detected. They grow for some time before they are discovered, and no pain, nor redness, nor other sign of inflammation, is perceived ; they may increase to 20lbs. weight, and yet no symptom whatever of inflammation is shown during the whole of their steady growth. They produce pressure on the surrounding parts, and its usual effects, condensation of the cellular texture, and consequently, in most cases, a cyst, more or less perfect, around them ; absorption of the neighbouring substances, even of the bones which are in contact with them in the interior of the body ; stretching of the skin which covers them, and attenuation of its substance, till it at last gives way by ulceration ; and yet, perhaps, no inflammation will have been brought on.

Generally, however, there is a period in the growth of every tumour when inflammation is established, and at this time a sudden increase of the growth of the tumour is observed with all the usual signs of inflammation, and the occurrence of further changes in the new textures—ulceration, suppuration, and sloughing. The disposition to such alteration depends partly on the original texture of the tumour ; it takes place early, and pretty certainly in

cancer, for instance, while a fatty tumour may have shown no tendency to inflammation when it weighs 40lbs. It depends, however, partly on the situation of the tumour, and its power of obtaining skin from the contiguous parts. A tumour on the hand would, therefore, generally ulcerate sooner than one on the thigh or shoulder ; and one behind the jaw can scarcely gain so large a size without ulcerating as another situated low down in the neck. You must not, on this account, reckon ulceration over a tumour as a certain sign of its malignancy, or of its fatal tendency.

However they are originally formed, tumours are supplied with blood from the vessels around them ; sometimes one or two arteries only enter at the base of the tumour, and it increases uniformly towards the surface ; at other times vessels enter the tumour in every direction, and every cut of the knife, in an operation, induces great hæmorrhage. Attempts have been made by Maunoir, and other persons, to cause the destruction of tumours by tying the principal vessel which supplies them, and thus deprive them of blood altogether, or to such a degree as to stop their growth. The effect, however, has usually been only temporary, just as when this operation has been done for bronchocele ; you close one vessel, but others very shortly increase in size, so as to supply the loss. Sometimes, again, changes are produced by the operation, making the tumour ulcerate and slough, from its possessing less vitality than the original textures of the body ; but a successful result from this method of treatment is very rarely met with, and in most instances no difference at all is produced by it ; the new action once established, goes on nearly uninterruptedly, since the original cause is uninfluenced by a diminution of arterial supply. The rapidity with which they grow is, however, very various. I have seen a tumour in less than ten weeks increase to a greater bulk than that of two persons' heads joined together ; while another, at the end of twenty years, may not be larger than a pea. Most tumours increase with moderate rapidity for a certain time, and then suddenly enlarge in a much greater ratio, so that a few weeks will make a greater difference in their size than as many preceding years.

The tendency to the formation of tumours arises in part from original texture ; thus glandular organs, such as the breast or liver, are more liable to them than the heart or lungs ; but such a rule is not universal, for the salivary glands are scarcely ever thus diseased ; the more vascular tissues, such as the skin, are also more disposed to the formation of accidental growths than simple parenchyma.

I have explained to you the meaning of analogous and heterologous tumours. Mr. Hunter's definition of a tumour is "a circumscribed substance produced by disease, and different in its nature and connections from the surrounding parts." Now this is true—but in a limited sense. For it is curious that most tumours are assimilated to a certain extent, to the organ

or tissue in which they reside ; thus the same cause in action upon the bone will produce some form of bony tumour, which, influencing the adipose tissue, will cause the new structure to assume the nature of fat. Thus it happens, that certain structures are confined to certain situations ; polypi to the mucous membrane ; epulis to the gums, and so on ; so that I shall leave these special diseases to be described when we speak to you of the diseases of such parts in subsequent lectures. So, also, many of the analogous formations are so from their situation, such as this mass of bone and cartilage, which was attached to the femur ; but in other cases their structure does not depend on any local cause, such as this cartilage from a gland, or this mass of bone from an ovarian cyst. The heterologous formations are more universally alike, and present nearly the same structure wherever they are situated, whether in the breast or arm. Whether you examine a fungus hæmatodes tumour in the lungs or kidney, or brain, there is no great difference ; it is not only unlike the texture in which it grows, but like nothing you will observe which is met with in any natural part of the body : such, for instance, is this melanosis of the lungs. Even these tumours, however, are modified slightly by the textures around them, and fungus hæmatodes of the bones, or of the lungs, presents some points of dissimilarity. Of course, two exactly similar structures will occasion various symptoms and appearances of form and size, according to the organs they reside in, and whose functions they interfere with, whether it be the lungs or brain. I shall, therefore, confine myself at present to a general description of such tumours as will require, hereafter, a more minute account, from the several organs in which they may be met with ; and most of what I have to tell you will apply to such formations wherever they may be found.

New structures situated in the internal organs for the most part affect the form of tubercles, and these are generally of a defined circular form, *e.g.*, fungus hæmatodes, or scirrhus of the lungs or liver, in the cellular tissue of these organs, where they fall under the care of the physician : in external organs, on the contrary (with which we have chiefly to do,) from obvious reasons, such as pressure, and so on, tumours are more frequently irregular in figure, of indefinite size, and with various relations to other parts. Observe, for instance, this cancerous tumour of the breast, and these cancerous tubercles in the lungs of the same individual. These, however, are trifling distinctions compared with other circumstances. A great difference between analogous and heterologous tumours arises from the latter being frequently more universal in the several parts of the body ; frequently appearing in several organs nearly at the same time, or in some parts in consequence of their formation elsewhere. With analogous structures, on the contrary, this is never met with ; though they may be

fatal, it is from local circumstances; and though they may have taken place in several parts at once, yet none are affected by absorption from the first.

This brings us next to the most important of all distinctions between different tumours; the separation of those that are innocent, from those that are malignant. What then, you will ask, are we to understand by malignancy? Mr. Hunter says, a malignant disease is one in which "the destructive action overbalances the restorative;" and such is the common sense in which the term is employed; as synonymous, in fact, with an incurable ulcer. Thus lupus, or the corroding ulcer of the uterus, are often called malignant. But it seems to me that something more is necessary to constitute a malignant disease, than its being incurable, or proceeding rapidly to a fatal termination. I would limit the term malignant to such diseases as are *incurable from their possessing a new formation, capable of generating the same or an analogous disease elsewhere*. This contaminating property is exerted in several different ways. 1st. The new structure produces a similar disease in the surrounding textures; 2ndly, the absorbent glands are affected by absorption from the new substance, so that similar tumours are formed in them; 3rdly, both these influences may be going on at the same time; 4thly. Without any apparent alteration in the absorbent glands, the whole system becomes contaminated by the influence of the disease; doubtless by a poisonous effect upon the blood, so that tumours of the same kind as that first formed appear in other organs or distant parts of the body; or lastly, all these effects may be produced at the same period. By the limitation I have laid down, then, lupus cannot be considered as a malignant disease, since there is no new formation independent of the deposits of inflammation, and therefore the disease may be arrested or cured sometimes, and there is no contamination of the absorbent glands, nor of the whole system; even if half the face is destroyed by the ulceration, yet there is no evidence of any poisonous influence upon the constitution.

Mr. Lawrence says "that tumours which in their regular progress destroy life by the changes occurring in the affected parts, such as ulceration, bleeding, sloughing, or by causing similar productions in other parts of the body, more particularly in important internal organs, or by both together, are considered malignant." Now this definition also, you will observe, is less precise than I could wish, unless the word *or* were changed into *and*. A tumour is not malignant, in my sense of the term, unless, besides its power of destroying life by the local changes which take place in it, it is also capable of producing contamination in other textures, either around it or in the glands connected with it, or elsewhere. Observe the broad distinction this makes in your practice; you remove a tumour which is about to become fatal, by bleeding, sloughing, and so on, but your patient

is perfectly safe after the operation, and you have no fear of any return ; but not so if it be malignant. There may be no evidence of contamination, and no ulceration or sloughing of the tumour, and yet the blood may be already poisoned, though you cannot detect it, and you cannot be at all confident that the patient will not die from tumours in other situations, of the same character as that you have entirely removed from the part first attacked.

It is, indeed, sometimes difficult to decide, from appearances, if a tumour be malignant or not—whether a crop of warts, for instance, are of the common kind or are cancerous warts ; and in diseases really malignant, and apparently alike in appearance, there may be a considerable variety in the degree of malignancy.

1st. I have described a disease in the 19th vol. of the Medico-Chirurgical Transactions, under the name of the verrucous tumour of cicatrices, which resembles in some respects the cancerous warts of the penis, but they are of a very different degree of malignancy ; the former being so in the very lowest degree, semi-malignant, as it is sometimes called, affecting the neighbouring skin only with the same new structure, and not contaminating the glands, and therefore capable of being removed with almost a certainty of success ; while on the other hand, the operation is very precarious when performed for cancer of the penis.

2ndly. Cancer of the scrotum is a malignant disease in a more extensive sense, since it does contaminate the glands, and is followed by the formation of cancerous tumours elsewhere, and yet the system may be uncontaminated 40 years after the disease first showed itself. I have seen it thus in an old chimney-sweeper, who was in the hospital at the same time with his son for this disease, who had had a cancerous tumour removed three times, and yet not even then were the glands in the groin affected. So that in tumours even of this degree of malignancy an operation offers a very fair prospect of permanent success.

3rdly. Look to the progress of cancer of the breast, on the other hand, and you will almost always find the glands contaminated, and the whole system affected by the poison, so that an operation for cancer, which is malignant in this high degree, presents a very feeble chance indeed of a successful result.

And yet, 4thly, Even the most malignant tumours, which spread their contaminating influence in all three ways, seem to be very different from one another ; some passing through their whole progress in the course of a few months, while I have seen other cases in which several parts, including the glands, have been at once affected, and yet little suffering had been occasioned to the patient in more than 20 years from the commencement of the disease.

There is such great variety in the structure of tumours, that I can only lay before you the leading facts concerning them in the description which I shall attempt, and any kind of arrangement of them must be imperfect. The classification proposed by Mr. Abernethy, and which has been most followed, is founded on the internal structure of tumours, and it has been much objected to, because the diagnosis can only be verified after death. In a very recent work by Dr. Warren, an American author, he has adopted a classification founded on the organ or texture in which the tumour originated—tumours of the skin, muscles, arteries, and so on—which to me appears much more objectionable, since the same kind of tumour must thus come under notice many different times, as they occur in the lungs, liver, or uterus, though they are exactly of the same nature, such as cancer, fungus hæmatodes, and such like, in each part. I must say I think a division founded on their anatomical nature is the best, which will also sometimes designate their origin. It is true we cannot be quite positive of the nature of a tumour till we have dissected it, or examined the whole body; but such is also the case with regard to ulceration of the bowels, or disorganization of the kidney; and yet, who scruples to speak of such diseases as if he knew their existence, and to give his prognosis accordingly? In the same manner I think, with care, we may generally be right as to the nature of tumours, if we attend accurately to the history of their occurrence and growth, to their form, colour, size, weight, solidity or fluidity, and the symptoms they occasion, or are accompanied with. To borrow the mereantile phrase, no one can pretend to be infallible, but I think we may generally be right, errors excepted. I shall select also, as far as possible, the terms already in use, though unfortunately the same term is sometimes employed in totally different senses: mammary tumour is, for instance, meant to designate an innocent tumour *in* the breast, by Sir A. Cooper, while others, following Mr. Abernethy, intend by this name to describe a kind of malignant fungous tumour *like* the breast, and situated anywhere. In fact, it is so difficult to describe accurately in words, or to delineate by drawing, the appearances of different tumours, that it is not easy to know what various pathologists are discussing in the classifications hitherto followed. The class of tumours may be divided, then, into three orders:—I. Encysted tumours. — II. Osseous tumours. — III. Sarcomatous tumours.

The latter term was invented by Mr. Abernethy, and is intended to designate—not tumours resembling flesh, but tumours more or less solid, in which neither cysts nor ossified matter form the chief characteristic. Each of these orders, again, contains several genera, and some of these may be divided into distinct species, and occasionally we shall find more than one variety of the same species. But although some tumours possess so

well-marked a structure, that their genus and order become at once apparent, yet all tumours are so far allied that the several structures are sometimes intermixed; some tumours, called sarcomatous, have cysts mixed with the solid substance, either surrounding it, or connected with it; and so some osseous tumours are mixed with cysts occasionally, or with solid substances not osseous; and some genera are, of course, still more like one another, and pass insensibly into each other in appearance. We shall find that this circumstance is especially the case with malignant diseases, so that tumours belonging to two or three genera are often seen at once in the same person, or the same tumour may, in different parts, have a mixture of two or more kinds of structure—of cancer, with fungus hæmatodes or melanosis; or a tumour of one kind having been removed, of the nature of cancer, may, on returning in the same part, exhibit an alteration in its character to fungus hæmatodes, and *vice versa*.

Some tumours, lastly, may possess such distinct characters that their place is evident; others, on the other hand, may be of so ill-defined or uncertain a structure, that you may be obliged to place them under the head of tumours to which they bear the most similarity, without being quite confident of their real nature. Any division that I could form, must, in fact, in the present state of our knowledge, be an approximation only to the truth, for the purpose merely of assisting your diagnosis, and guiding your practice.

Order I.—ENCYSTED TUMOURS.

Genus 1.—*Sebaceous Encysted Tumours*.

I. The first order of tumours, then, is that of *encysted tumours*, by which I mean not merely the condensed cellular tissue that may give a covering to any tumour, or to an extraneous body, but a cyst which has a secreting internal surface, by which it is filled with various contents, for the most part fluid and unorganized. They may be divided into five distinct genera, that are not always sufficiently distinguished from each other in practice.

1. The most common genus should be called *sebaceous encysted tumours*; they are situated immediately under the skin, are globular, or oblong and flattened, elastic, seldom fluctuating (even when fluid), from the thickness and distension of the sac, but more elastic than sarcomatous tumours. The species are named from the nature of the contents.

a. Milieurous, or like a mixture of honey and wax.

b. Atheromatous, a half-fluid substance, unctuous, like pap in consistence, sometimes rancid and offensive.

c. Steatomatous, or more of the consistence of fat than the rest, and almost solid in appearance, till it is pressed out and found to be unorganized.

These three species, which are most common, are all of the same nature,

and originate in obstruction of the sebaceous follicles, and the consequent retention and alteration of the natural secretion. The cause of their formation was first ascertained, I believe, by Plenck, in his "Systema Tumorum," and has been more recently pointed out by Sir Astley Cooper, not aware probably that it had been previously described. You will constantly see little black specks arising from partial obstruction, from which you can press out the thick oily substance designed to lubricate the skin. A gentleman, whose sister had died of cancer of the breast, came up to town from Oxford, and begged I would immediately visit him; and I found him in a great fright from the discovery of a blue tumour of the size of a nut on the skin of the abdomen, which he thought was cancer; but I was able to relieve his fears by opening the orifice with a probe, and picking out the hardened matter contained in the cyst, which was thus seen with its duct on a magnified scale. And if the opening is distinguishable, as it occasionally is in this condition, you may palliate the complaint by giving exit to the contents of the tumour from time to time. Sometimes the contents are different from those of the three species already mentioned.

d. Hair is occasionally found rolled up to a great length, and generally without the bulb of ordinary hair, though formed, no doubt, by the hair having been obstructed in its passage through the cutis, at the same time that the atheromatous sebaceous matter with which it is generally mixed became confined.

e. At another time horns are formed by the hardened sebaceous matter projecting through an enlarged follicle or ulcerated opening, to the length of several inches, occasioned by the recently secreted matter pushing out that which had previously been formed. These horny sebaceous tumours are often seen on the forehead, where no one, I presume, would wish to exhibit them openly, however quietly such appendages are sometimes worn in private.

f. Sometimes, again, the interior of the cyst ceases to secrete, and becomes lined with cuticle, so that a large orifice is thus left leading into the cavity of the former tumour, below the level of the skin.

Sebaceous encysted tumours are, of course, most common where the follicles abound, especially on the head and face, and back. Numerous hard little bodies are met with on the penis, and in the eye-lids, which originate in the same way; and there are often a considerable number in the same person, as in this plate of Alibert's, or in a patient of Mr. Keate's, whom you have lately seen operated on.

These tumours often grow to a considerable size, and exist many years, before they occasion such pain or inconvenience as to lead to any surgical assistance being applied for. When large upon the head they will sometimes produce headaches, and by their pressure have more rarely still led to the absorption of part of the bone below them. Occasionally, also, when rubbed

by the hat or otherwise irritated, they inflame and increase in size; and then the fluid is partly absorbed again, and they return to their former bulk; or the orifice opens, or ulceration ensues at the apex, and the contents are partly discharged, as from an abscess, but with a small quantity only of pus mixed with the greasy secretion of the cyst. Sometimes there is more severe inflammation still, and the sac sloughs away, and the ulcer heals, so that a natural cure is effected. .

It is wrong, however, to allow this, if the removal of the tumour is permitted, as the ulceration is sometimes very troublesome, and produces severe irritation. It is wrong also to attempt to imitate this process, and to open the cyst with a lancet, or pass a seton through it, or destroy it with caustic. If, indeed, the tumour is small and uninflamed, and the patient refuses to have it removed by the knife, you may puncture the cyst, and let it heal, from time to time.

But the removal by the knife is the best and safest method of treatment, before the tumour has attained any great size, and before inflammation and ulceration have taken place.

The incision is generally very easy, when the tumour is of a moderate size, if it is done in this manner:—Make an incision through the skin rather longer than the diameter of the tumour, down to the surface of the cyst, but without wounding it; then with your thumb-nails press back the skin on both sides from its surface, and insinuate them under it, when it will start out like this, which I thus took away from the head of a lady; or this larger one, which I subsequently opened to show the cyst. There is little bleeding, and the incision heals by the first intention, so that you need not with small ones have the hair shaved off, but make a little pressure with lint, after oozing has ceased. A large one will more probably suppurate, so that you have to open the wound again; and therefore it is better to shave the hair previous to the operation. If you accidentally open the cyst, then squeeze out the contents, and with a pair of forceps tear out the cyst from its cellular bed, the edges of it being easily seen, and if the cyst is thin or large, the best way is not to try and remove it whole, but cut at once through the skin and the front half of the cyst, and then drag it out in the same way. If the skin be adherent, or the cyst has inflamed so as to adhere at its base, which is less common, a little dissection becomes necessary; but take especial care not to cut into the occipito-frontalis tendon, lest you produce a troublesome and dangerous form of cellular inflammation. With this tumour, which I removed after a very successful operation for cataract, in an old man of 75, I was unlucky enough to have an attack of erysipelas, which you must sometimes expect, and endeavour to guard against, by looking to the condition of the system before this apparently trivial operation.

In the cheek or temple the cyst is almost always very thin and transparent

so that you need seldom try to dissect out the cyst entire, but divide it partly in the way I before mentioned ; or if it is very small, you may divide the skin, and raise the tumour with a tenaculum, and cut it out along with a little fat around it ; recollecting, of course, the situation of the parotid duct, and facial nerves.

When the part has inflamed and suppurated, you may lay the cyst open ; and if it adhere so as to render the dissection difficult, you may rub the interior slightly with potassa fusa, or nitric acid, and leave it to slough. The great point in any plan of treatment is to leave not the least portion of the cyst behind, since it will then return again. A gentleman, for instance, had an encysted tumour removed in Dublin, and it came again in the cicatrix a few months afterwards ; it was of small size indeed, but being on the back of the neck, it inflamed after hunting one day, and I dissected it out while suppurating, notwithstanding which the wound healed by the first intention. When situated on the back or limbs, pressure will almost always have produced adhesion, so as to render dissection of the skin from it necessary.

LECTURE II.

2. Serous or Aqueous Encysted Tumours.—3. Hydatid Encysted Tumours.—4. Congenital Encysted Tumours.—5. Bursal Encysted Tumours.

I.—2. *Serous or Aqueous Encysted Tumours.*

THE second genus of encysted tumours may be called the aqueous or serous encysted tumours, and they consist originally of a thin delicate secreting cyst, containing a transparent fluid, like water in appearance, and composed of pure water, with a small quantity of animal matter, which Dr. Marec has termed muco-extractive matter. This fluid is not coagulable by heat, since it contains no albumen, as serum does, and therefore the term *serous* has been given, you will observe, not to the secretion, which is aqueous, but to the cyst, which is like the serous membranes in appearance, especially the arachnoid membrane, which, you are aware, secretes scarcely any albumen naturally. You will find a minute account of these tumours, especially as to the liver and kidney, in a paper of mine, published in the 18th vol. of the Medico-Chirurgical Transactions [see *postea*.] These cysts have also been called hydatids, but very erroneously, since they are fixed, and attached to, and nourished by, the vessels of the surrounding parts, and are not parasitic animals, which will be hereafter described to you. They are termed spurious hydatids by Mr. Hunter, but I think either of the names I have mentioned is better.

It is conjectured by Dr. Hodgkin, that they originate in the obstruction of excretory ducts, and Sir A. Cooper assigns the same origin to an analogous disease of the testis. Now there is no doubt that cysts of fluid are often

formed in some glandular structures, such as the breast and kidney, in this manner, and in the same way also in the ducts of the salivary glands, and I believe the mucous follicles are obstructed so as to form similar tumours about the vagina and elsewhere. It may be objected, perhaps, that tumours thus formed should be termed mucous encysted tumours; but, in fact, their secretion, when thus confined and changed, is no longer mucous, but the cysts become exactly like serous membranes, and the secretion from them is often transparent water. All this is no more than we should expect *à priori* as analogous to the origin of the sebaceous encysted tumours. But we must not forget that this will only account for some such tumours, and that serous encysted tumours are met with in the cellular tissue of organs that have no secreting property, and no ducts to be obstructed. Look, for instance, at this plate of Dr. Hooper's, of cysts of this kind in the brain, or at a preparation from a patient of Dr. Macleod's recently, in which you may see two large serous encysted tumours, in the same organ. Here, then, they must arise in a different way; possibly by enlargement of the cells of the cellular tissue: whether the fluid secreted in them is first prevented by some peculiarity from being absorbed, and the cyst subsequently condensed, or whether the secreting cyst is first organized in a peculiar way, may admit, indeed, of dispute.

After a time, changes often take place in the cyst and in its secretion, altering the appearance of the disease. The fluid becomes more mucous and tenacious, but still transparent, or brownish and opaque; or some albumen is deposited, generally sinking to the bottom, or lining the cyst; or the fluid is mixed with blood, though still transparent, or dark and thick, like currant jelly; or green, or black, like ink; or sometimes mixed with pus. So also the cyst sometimes loses its delicacy and transparency, and becomes thick and opaque, like the reflected pericardium, or tough and fibrous, like the capsules of some of the joints; and sometimes, also, the cysts become partly ossified.

Both the names given to this genus become, therefore, inapplicable to every stage of the disease, and a new one would be necessary for every change in the fluid, or in the cyst; we may, however, without much impropriety retain the name for every encysted tumour, which probably consists originally of a simple serous cyst, secreting an aqueous fluid.

You see before you the disease in various organs, in these preparations from the brain, ovary, liver, lungs, testis, breast, spermatic cord, neck, thigh, and so on; in fact, scarcely any part seems exempt from their formation.

Examine these tumours in the living person, and you find a smooth, firm, elastic, rounded tumour, in which fluctuation is very evident when you tap it, unless the sac is very small and much distended, in which case they

sometimes feel very solid and hard. You find them of every size, from that of a pea to a sac containing several gallons of fluid, and yet still retaining its original appearance. If, however, the sac has become very thick and fibrous, the diagnosis between a tumour of this kind and a solid tumour becomes more difficult, though with care you will seldom fail to distinguish the fluctuation of fluid even when they are deeply situated, as in the abdomen, in which situation they acquire the greatest size; probably from the inferior degree of pressure to which they are subjected. Their deeper situation will almost always distinguish them from the last genus (the sebaceous encysted tumours), which can, of course, only be formed beneath the skin. Their general freedom from inflammation, and its attendant symptoms, will usually distinguish them from abscesses, although, if they grow very rapidly, they sometimes occasion a good deal of pain, and even considerable constitutional irritation; and they are most like the two next genera of tumours, from which, in some instances, there can be no means of distinction till they are dissected.

The treatment of serous encysted tumours must depend partly on their size and situation, partly on the condition of the sac and the nature of its contents.

1stly. If they are superficial and the sac thin, and the fluid watery, or nearly so, you will sometimes succeed in producing absorption of the fluid and obliteration of the cyst, by external stimulation. You may try this lotion:—

R Muriat. Ammoniaë, ʒij. ; Aëti, ʒix. ; Sp. Vini Rectif. ʒiij. M. ft. Lotio.

If this excoriates the skin, the following may succeed:—

R Lignor. Plumbi Subacet. ʒj. ; Sp. Camphoræ, ʒvij. M. ft. Lotio.

By something of this kind, assiduously applied on linen, even large tumours will sometimes be cured, when near the surface.

2ndly. They may be sometimes cured by puncturing the cyst, and evacuating its contents by means of a grooved needle, or a trocar. On the exterior of the body this plan will generally be a palliative only. A girl was under my care for a long time, with a tumour at the side of the neck, who was unwilling to have measures adopted for its perfect cure, but was relieved from the inconveniences of its pressure upon the larynx and œsophagus, by evacuating about eight ounces of aqueous fluid, from time to time, by a small trocar. In the interior of the body a single puncture will very often obliterate the sac, probably because very effectual pressure can be made, so as to keep the sides in contact. You have very lately seen me evacuate twelve pints of pure water from the abdomen of a young woman in whom the tumour had existed four years, and did not appear to be connected with the ovary, though I cannot say to what part the sac, that no doubt contained the fluid, was attached, unless it was the liver,

as Dr. Chambers believes. A few years ago I saw Sir Benjamin Brodie puncture a cyst of this kind, in the liver of a boy of 12 years of age, a patient of Dr. Chambers, and let out a pint and a half of pure water; and the boy seemed to be cured when he left the hospital. In another case Sir B. Brodie had an opportunity of seeing a young lady five years after the same operation for a serous encysted tumour of the liver, and no return of the disease had taken place.

3rdly. Although you cannot at once procure the absorption of the fluid by external irritants, nor by simple evacuation of the contents of the cyst, yet you may succeed by using both means; the secretion of the cyst, when it fills again, being sometimes different from what it had been before the puncture (just as you will find to be the case with regard to enlarged bursæ), and yielding to the lotions you had employed without success before the puncture. A woman had a good deal of inconvenience from a tumour, the size of an orange, in front of the trachea, and having punctured it with a needle, and let out four ounces of dark-red fluid, I applied an irritating plaster of ammoniacum, with a little powdered cantharides sprinkled on it. The cyst partly filled again, but then became smaller, and entirely disappeared in five or six weeks. These simple means may then always be tried before having recourse to the more severe; and if they fail they do not at all interfere with what I have next to recommend.

4thly. Then if adhesive inflammation is sufficient to cause the obliteration of the sac, suppurative inflammation will probably succeed, which may be excited by making a moderate incision into the tumour, and dressing it lightly with lint to the bottom; or by means of a seton through the longest diameter, as recommended by Maunoir, of Geneva, and by Dr. O'Beirne, of Dublin, for what the former terms hydrocele of the neck, *i.e.*, an aqueous encysted tumour in that situation, where it is not uncommon, as you will already have seen.

Both these methods are often employed for encysted hydrocele of the spermatic cord, which is this disease of that part. The unfortunate Delpech, whose tragical end by the hand of one of his own patients excited so much sympathy a few years ago, cured some very large ones in the orbit and neck by dressing with lint, one containing as much as two pints of fluid; but I should tell you that one patient died from the sac passing through the orbit into the cranium. For a circumscribed and accessible tumour I like free incision, and dressing with lint; for a large and irregularly-shaped tumour among muscles, the seton is to be preferred, as the irritation sometimes requires to be continued for several months before the sac contracts enough to be finally obliterated; and you must be prepared in important situations, such as that in the neck, for a good deal of local irritation and severe constitutional disturbance, from either plan of treatment; and if small and not incon-

venient, and not growing, you should not unnecessarily expose your patient to risk. If you use a seton, you may make an incision at one part, and through this introduce a long straight or curved trocar, and pass it out in the opposite direction ; and through the canular some silk may be passed.

But 5thly, you can scarcely hope that a tough fibrous cyst, or one mixed with bone, will be removed by absorption, or filled up by granulation ; and therefore it must either be destroyed by caustic, or removed. Having, therefore, opened the cyst freely, you may rub the interior with strong nitric acid, applied by means of some linen tied on the end of a small piece of wood. A man, 55 years of age, had a tumour in the neck, divided by the sterno-mastoid muscle into two portions, one of which was situated in the triangular space between the mastoid and the trapezius muscles ; the other projected on the inside of the sterno-mastoid muscle, pushing the larynx to the right side, and making him disturb every one by his snoring at night, and interfering much with the functions of the parts. It was dark-coloured, and seemed disposed to burst. I punctured it, and let out ten or twelve ounces of transparent fluid, and a second time a thicker fluid, mixed with blood. As it filled again rapidly, I made an incision into it, and rubbed the inner surface with nitric acid, the inside being irregular from bands of ligamentous structure in several directions. I felt the sealeni muscles behind, on the outside of the sterno-mastoid, and other muscles from the sternum in front ; the larynx and trachea were attached to the cyst at its inner extremity, and I could feel the vessels at the back part in contact also with it. By the fourth day the cavity had contracted to a small size, and the sloughs had almost separated without much inflammation, when he was unfortunately attacked with fatal erysipelas. This circumstance might, of course, follow any mode of treatment ; still you should reserve this plan to the last, as attended with greater risk than the preceding methods of treatment.

Lastly, you will see here some cysts which have been entirely dissected out ; and if accessible, and the sac be fibrous or osseous, this operation is to be preferred to the caustics ; but it is often quite inadmissible. A young child was a patient of Mr. Keate's in this place, with a cyst, which I saw him puncture, in the nates, which evidently came out of the sciatic notch, beyond reach of the knife ; a child, two years of age, was a patient of Mr. Babington's, with one or several cysts, reaching from the axilla to the neck, through all the vessels and nerves of that cavity ; and the case I have just now mentioned shows you what you would meet with in the neck. Here is a preparation of a cyst in the neck, mixed with the solid matter of fungus hæmatodes, and which I therefore only punctured to let out the fluid ; but observe what I should have encountered if I had tried to remove it : here is the jugular vein in front, the nerve at the side ; and behind it, three inches from the vein is the carotid artery, and all closely attached to the cyst.

Even if not mixed with malignant substance, be very cautious how you remove these serous encysted tumours in the neck. Dr. Warren, in the work I have before alluded to, well remarks, how tempting they sometimes look, as if quite detached, while in reality processes of the tumour may dip into very important situations ; and he relates two cases, in one of which he tied the internal jugular vein, held aside the par vagum, and dissected off the common carotid artery ; and in the other, the internal carotid artery and jugular vein were both left insulated, after a difficult dissection, in the upper part of the neck. He very properly thought the operations, when he had completed them, scarcely justifiable with his knowledge of the connections of the cysts ; and very likely the cases might have been cured by the other means which I have described. In all operations on the neck for tumours, you will do well also to recollect, that air may get into the veins, and cause an instant death.

All these operations, however, are occasionally liable to be attended with dangers. Having punctured the cyst, it may inflame, when you do not wish it to do so, as when situated in the interior of the body, especially if growing rapidly before the puncture. A little boy had a tumour on the right side of the abdomen, occasioned by a blow six weeks before his admission into the hospital, under the care of Dr. Seymour and myself. As he was suffering very much, I punctured it, and evacuated eighteen ounces of water, showing, therefore, that it was one of these cysts, the nature of the case having been previously obscure. When he died from the rapid growth of the tumour afterwards, I found it nearly filling the abdomen, and even projecting below Poupart's ligament. I gave an account of this case, along with the description of these tumours in the liver, in the *Medico-Chirurgical Transactions*, but you may see in this preparation the thinness of the cyst when containing five pints of water mixed with pus, and the curious circumstances of there being a separate kidney removed from the right, and both attached to the cyst.

Here is another of these serous encysted tumours from the neck, which was punctured, but bled so largely, from an unhealthy state of vessels, that it was obliged to be removed by Sir Benjamin Brodie ; but the patient died of sloughing. Occasionally when opened, a peculiar action takes place, and a fungus arises, sometimes called malignant, though erroneously. In a patient of Mr. Walker's in the hospital, with a cyst of this kind in the breast, a large unhealthy fungus, three inches in diameter, with great pain and excessive foetor took place, requiring the amputation of the breast ; the case did well, however ; nor, as far as I know, is there any reason in such cases to expect a return of the disease from any thing malignant in its nature. Perhaps this fungous growth is more likely to ensue when only a small puncture is made and left open, or when the cyst is thick and fibrous, than when it is freely opened, and the sac still thin.

A man was admitted into the hospital, with a tumour of the liver of some standing, lately attended with increase of suffering, which I punctured, and let out a good deal of fluid, consisting of pus mixed with watery mucus, and tinged with bile. He was relieved for some time, and the cavity was nearly filled up, when it began to bleed a good deal, the edges ulcerated, and an unhealthy bleeding and sloughing fungus took place, very much like the appearance of a malignant disease, and attended with so much pain, that his sufferings were hardly alleviated by six grains of acetate of morphia daily. He became gradually emaciated, and died five months after the puncture, at which time the sloughing ulcer was fourteen inches broad by ten in its shortest diameter. Here is a preparation and a cast taken from a patient of Mr. Babington's, who died exactly in the same way, though the disease was of smaller extent. The ulceration here was so very like that of fungus hæmatodes that Mr. Babington could not help suspecting it was of that nature, though he was acquainted with my previous case. Now here there was no disease in the substance of the liver, and no hardness like that of an abscess of this organ, but only a little body of the size of a nut, that I am inclined to believe was an encysted tumour obliterated after the puncture, but assuming an unhealthy disposition analogous to that previously mentioned in the breast.

There is a variety of tumour described by some persons, in which a cyst at first appearing to be of the kind we are discussing, becomes filled with solid matter growing from one side of the cyst, and ulcerating and projecting through the opposite side. Mr. Abernethy describes one such case, where the cyst was cut across in amputating the arm, where the fungus grew again, and destroyed the patient. I cannot say I have seen any thing of this kind in an encysted tumour of the kind, I have placed before you, and I suspect the cases in question are instances of cysts with fungus hæmatodes, and not of serous encysted tumours. Here is a little preparation said to be of this sort, however, but I do not know its history.

Such is a brief account of this kind of tumour, but when situated in important situations other mischiefs may be produced. In the chest they induce oppression of breathing and suffocation;—in the brain fatal irritation of that organ;—in the liver they may give rise to anasarca and ascites, and occasion the death of the patient from their immense size, as much as twenty pints of liquid having been found in them, besides the fluid in the peritoneum. In one case I recollect a man being brought into the hospital in consequence of a fall from a waggon in which a basket struck him and ruptured one of these cysts of large size in the liver, and occasioned his death in a few hours, much of the substance of the liver having been absorbed by pressure.

I.—3. *Hydatid Encysted Tumours.*

The third genus of encysted tumours is composed of hydatids, and they may be found in many of the situations in which the serous encysted tumours occur. We have seen that the serous cysts are sometimes called hydatids, but erroneously, because the cysts are nourished by the vessels of the surrounding parts; the hydatid cysts, on the contrary, contain parasitic animals, zoophytes, which are nourished by imbibition only, by means of their own coats, from the fluids of the part in which they are situated. They are for the most part mere globular bags, situated in some cavity of a living animal, and are the *tænia hydatidea* of Linnæus. In the lower animals they generally have a distinct head, sometimes elevated on a kind of neck, with an opening through it into the great bag; they are found in immense numbers in sheep, sometimes in the liver, in what is called the rot, or in the brain in the disease termed the staggers, and they are often accompanied by the flat worms, the flukes; placed in warm water they evidently appear to have a kind of voluntary motion, and power of changing their position. The human hydatid has less evidence of distinct vitality, being seldom possessed of more than a contractile property by which it rolls up in a curious way, as you may here see; it is the *hydatis acephalocystis* of Rudolphi, scarcely ever being seen with a mouth or head; but occasionally the more perfect animal, the *hydatis cysticercus*, is found in the human subject mixed with the acephalocysts. The parent hydatid appears to have a power of generating others, which are attached at first to the interior of the original one, covered by a fine membrane, whence after a time they drop off, and float in a kind of aqueous fluid which fills each bag, of which there are sometimes an immense number, as you may see in these preparations. The smallest of them, when formed in this manner, are less than the globules of the blood, while others, as you see, are an inch or two in diameter.

Around them there is generally formed a cyst of cellular structure, like the serous cysts in appearance, which, like them too, becomes thick and fibrous, or even osseous, as in this example; but occasionally there is scarcely anything that deserves the name of cyst around the hydatids. The cellular cyst secretes a fluid that sometimes becomes thick and adhesive, and even purulent, in which case the fluid within the hydatids still remains thin and transparent, being changed by the independent vital properties of the coats which compose them, and undergoing a kind of assimilation. Sometimes, where the parent hydatid is large, the cyst is lined by a thick unctuous secretion instead of fluid, and occasionally it becomes quite filled with hydatids, broken down, and pressed together into a mass of the consistence of isinglass jelly.

Even the largest hydatids have no attachment to the cyst in which they

are contained. Here is a part of one, for instance, removed by Mr. Keate, from the breast, where three pints of fluid were evacuated by a puncture, and this single large bag was easily pulled out from the cavity in which it lay quite unattached. The cellular cyst in which these globular bodies are contained is often mistaken for the parent hydatid; but you will recollect, from the name I have given you of hydatid encysted tumour, that there is the *attached cyst*, containing *loose* hydatids and fluid.

How they become developed in the living body in such enormous quantities is a curious subject of inquiry—whether by spontaneous generation, as some persons imagine, or whether (as is more probable) the germs are conveyed by the mucous membranes or blood-vessels, through the textures of the body, till they meet with some appropriate nidus, in a frame fitted by ill-health, or disease of some kind or other, to favour their retention and growth.

The hydatid tumour is most common in the liver, in which situation most of these preparations were found, but they may be met with elsewhere, and I have already mentioned their occurrence in the breast and the brain; in fact, there is scarcely any part of the body in which they have not been seen by some person or other. The diagnosis of these tumours will be much influenced by the thinness or solidity of the cyst, and by the quantity and consistence of the fluid in which the hydatids float, and by the number and size of the hydatids themselves. The cyst will sometimes fluctuate distinctly, if the number of hydatids is small compared with the fluid, or if the hydatids are themselves large, so as to contain much fluid; at another time it vibrates rather than fluctuates, when the hydatids are very numerous and small, or the fluid of the cyst is scanty, or thick and gelatinous; sometimes, again, the cyst may be so firm, or so filled with hydatids, as to appear almost solid, especially when deeply situated. Sometimes they produce little inconvenience, even when of large size, so as to be distinguished by this circumstance from a collection of fluid pus; but on the whole they occasion more pain and impediment to the functions of the parts in which they reside than serous encysted tumours, which also generally fluctuate more distinctly than the hydatids. Sometimes they inflame and suppurate, but even then the existence of the semi-fluid tumour, for a definite time, before symptoms of suppuration showed themselves, will serve as a guide to the probable nature of the disease.

In parts of the body which have an external communication, they occasion little disturbance of the general health. I have seen them discharged by the bladder from the kidney, for a great length of time, with only occasional inconvenience from their obstructing the urethra. Not a very uncommon situation for their growth is, however, behind the bladder, where, having no exit, they have produced fatal pressure upon this organ, with consequent disease of the kidneys. So, also, in the brain or heart, although they have

been found, when unsuspected during life, they can scarcely increase much without serious consequence. Sometimes it would seem that the containing cyst in the liver or spleen bursts, and some hydatids escape into the peritoncum; sometimes a vast number of separate cysts of hydatids are found in various parts of the abdomen, amounting to many pounds weight, in which case an irregular surface of vibrating tumours would be a diagnostic sign. What are called hydatids are often found in the uterus, as in these preparations; but I doubt their nature, since you may see an attached surface from which they grow, and they are fixed to one another like bunches of grapes, so that they must have a different mode of generation, and are, in fact, all attached intermediately or directly to the uterus. These tumours grow to a large size, and are the result, as it appears, of conception with disease of the membranes of the ovum; and though discharged from the uterus by means of its external opening, the disease is frequently fatal, by the severe symptoms occasioned by their propulsion.

Occasionally it would seem as if the hydatids cease to increase, and the cyst remains stationary, or contracts upon the dead animals. More commonly their death induces inflammation and suppuration in the containing cyst; and I have seen several pints of broken down hydatids, mixed with semi-purulent fluid, evacuated by the trocar. Sometimes, even after pus has been formed, a natural cure has been effected by the tumour ulcerating towards one of the surfaces of the body. Mr. Keate mentioned to me the case of a gentleman who was for a long time ill with some obscure disease, who suddenly had a kind of diarrhoea, in which one potful after another of hydatids was evacuated, from some encysted tumour of this kind giving way. A lady was under Dr. Seymour's care with a tumour of the liver, which disappeared, and the patient recovered, after the hydatids were discharged by stool. Sometimes the tumour in the liver ulcerates apparently into the duodenum, instead of the colon, and these bodies have been vomited as well as discharged downwards. At other times a communication has been established through the diaphragm, and the hydatids from a cyst in the liver have been coughed up for years through the lungs. In all these cases the patient may get well, and has, perhaps, quite as good a chance of surviving as when an opening is formed either spontaneously or artificially, on the surface of the body. Whether opened or not, however, they may occasion death by rupture, or irritation, in the same way as the serous encysted tumours. For a detailed account of them in the liver, I may refer you to the same papers I have alluded to in the *Medico-Chirurgical Transactions*.

Next as to the treatment of these cases of hydatid encysted tumours; which, however, must necessarily vary according to their situation or connection as well as their actual state.

1. Can you check their increase and get rid of the disease without

operation? One of these preparations, I believe, is from a patient of Dr. Chambers's, a young woman, in this hospital, whose tumour in the liver very much subsided under the use of iodine in friction. I apprehend, however, we cannot reasonably expect, from any treatment of this sort, more than a temporary diminution of the size of the tumour from absorption of its fluid part; at least I conceive it can scarcely kill the hydatids, or if it did so, leave them quiet afterwards. I should expect to see what took place in this case, namely, that having some relief for a time, the patient was obliged to return to the hospital, and died of the disease about a year afterwards, with suppuration in the sac. It can do little harm, however, to try for a time the stimulant lotions I before spoke of, as sometimes curing the serous encysted tumours. In some internal organs we can do little more than administer those medicines, such as tonics and alteratives, which are called for by the state of the system, and which may possibly affect the general health so as to retard their growth, or prevent their development in some other situation, or their return, if one such cyst has been cured. Or else we may remedy those symptoms of irritation from pressure which attend their rapid growth, and relieve the further evils which result from their inflammation and suppuration.

2. The tumours may be opened, the hydatids evacuated, and pressure applied, by which means the sides of the containing cyst will often be made to adhere, so as to become obliterated. This was the case with this large one from the breast, in which Mr. Keate made a puncture with a lancet and drew out the hydatids, and these bodies are so soft and brittle, that a large one, or great numbers of small ones, will come through a small aperture. In some situations, however, as in the liver, or other internal or deep situations, a trocar is preferable to the lancet, from the canula preventing the alteration of position of the textures through which the puncture has been made, from closing the opening. It has been recommended by Recamier, and some other persons, to make an opening by means of an eschar, successively destroying the skin and the subjacent parts, till the sac is reached, both for the aqueous and hydatid encysted tumours, the object of which mode is to procure adhesion of the peritoneal surfaces, and thus prevent extravasation into the cavity of this membrane. I presume, however, the operation will not lightly be performed in the liver or other important viscus, so that adhesion will generally have taken place before the operation; and extravasation is not very probable, even if it has not done so, since the cyst must at least be in contact with the parietes, or we could not make the puncture, and in that case pressure, by means of bandages, and long straps of adhesive plaster, would almost certainly keep them in contact after the puncture. I cannot approve of this caustic mode, if no inflammation has taken place, since its adoption under such circumstances wholly precludes any chance of the sac being

obliterated by adhesive inflammation after the puncture, and the chance of mischief from the open suppurating cavity, which is, of course, invariably produced by the caustic, is, in my opinion, more dangerous than the occasional probability of inflammation from extravasation of the fluid of the cyst, which is not an irritating fluid unless it happens to contain bile, when situated in the liver.

As I have only once or twice seen hydatids in the limbs, let me mention a case in this situation, to show you how reasonably we may hope to procure union by the first intention, and obliteration of the sac, when an hydatid encysted tumour requires a puncture, from its size. It is published in the *Medical Gazette*, by an intelligent surgeon (Mr. Attenburrow, of Nottingham), whose son was formerly a pupil of mine. A tumour began about the groin, a month after a fall, and in eleven months increased so as to reach from the pubes two-thirds down the thigh, and to measure twelve inches long, nineteen broad, and thirty-three in circumference. So large was it, therefore, that I think much credit is due to the surgeon for distinguishing the tumour from one of fungus hæmatodes. Mr. Attenburrow punctured it with a trocar, and evacuated seven pints of fluid, with quantities of hydatids; a bandage was then applied, and the cavity became obliterated, and the patient got well.

Such, then, is the simplest mode of proceeding with hydatid tumours, taking care not to produce injurious pressure; and with this view using a cupping-glass sometimes, rather than the hands, to break down and draw out the hydatids, and watching carefully the appearance of the tumour and the condition of the system after the operation; so that if it inflames and suppurates, which it does more frequently than after the puncture of the aqueous encysted tumour, we may directly open it freely, and give exit to the secretions of the inflamed sac.

3. If, then, the sac has suppurated previously to any operation being practised, the same operation becomes necessary, but the orifice should now be left open after the puncture, instead of being allowed to close. If the tumour is easily accessible it should be freely opened, so that no pressure may be necessary; and a small and insufficient opening is more likely to be followed by irritation, and that unhealthy inflammation and fungous growth, which I before mentioned as occasionally following the puncture of the aqueous encysted tumour. In important situations, however, as in the liver, the trocar of some size should be used, through the canula of which a catheter may be passed after the sac has been emptied, and in a short time the orifice may be enlarged, if necessary, when time has been afforded for more extensive adhesion of the sac to the peritoneum; or if you please you may open the suppurating cyst by caustic (if the symptoms are not so urgent as to require a more immediate evacuation), to which method there is not now the objection I formerly made to it in the uninflamed sac.

Can we facilitate the obliteration of the sac by any injections? I have not seen any used myself, for the patients have either died after the puncture, before the period of quiet suppuration has arrived, when the puncture has been made in an important situation, or else, when not dangerous, the cyst has filled up, and contracted readily, without them. Injections have, however, been recommended and practised by Recamier with success as it would appear, nor is there any objection, that I am aware of, to their use, if the sac is quiet, and does not easily contract or adhere, beginning with warm water, and afterwards employing a small quantity of spirit and water, or a weak solution of chloride of lime, or other mild stimulant. When the diseases of the bones are described to you by Mr. Babington, he will very probably mention a very interesting case of Mr. Keate's, in which he evacuated some hydatids from the diplôe of the cranium, by the trephine, with success; and I believe, in sheep, they have sometimes been removed by this operation from within the cranium.

4. Sometimes, lastly, the entire removal of the sac with its contents may be practised, in situations where it is easily accessible, and not of large size, and the sac is thick and fibrous. Here is a sac containing an hydatid removed by Mr. Babington from the cellular texture of the thigh, about three inches in diameter, and the sac something like fascia in appearance. It is only in cases such as I have just mentioned that I should be inclined to remove the whole tumour by the knife, rather than lay it open, and in many cases, even in the extremities, the excision must be quite impracticable, as in Mr. Attenburrow's case for instance.

I.—4. *Congenital Encysted Tumours.*

The fourth genus of encysted tumours I will call *congenital encysted tumours*, by which I do not mean all which are found at the time of birth; for instance, a young infant has recently been under my care for some encysted tumours about the neck and face and tongue, making the side on which they occurred double the size of the other. Several of these I punctured, and let out some fluid of different kinds in each, but for the most part like currant-jelly, and most of these cysts did not fill again, so that comparatively little swelling is left; but these were of the second genus, the serous encysted tumours, developed soon after birth. Neither do I mean that all tumours of the kind I am going to describe are discovered at the time of birth, but only that if formed and developed later in life they are of the same kind as those which are most usually congenital.

There are thin cysts met with, generally in young infants, containing a great variety of substances of a peculiar kind. Sometimes there is a quantity of substance like adipocire. I assisted Sir Benjamin Brodie in removing a large tumour of this kind from the back of the neck, of the most offensive

odour, which was situated too deeply to have been a large sebaceous encysted tumour. If I recollect right, a tumour which some of you have recently seen removed from the parotid gland by Mr. Walker contained some substance of this sort. Sometimes there is a quantity of fatty substance of a peculiar kind, which has been termed *stearine* by Dr. Bostock, which often contains mixed up with it a mass of long hair. There is here a portion of a large ovarian tumour, which I had tapped in this hospital, and evacuated about sixteen pints of dark liquid, and in which, after death, a mass of fat, half a pound in weight, was found mixed with another mass several inches in length, of long rolled-up hair. This is a drawing of it from Dr. Seymour's beautiful work on the ovaries, whose patient she was, while in the hospital. Sometimes the cyst contains some shining micaceous particles, like fat kept long in spirit, which has been called *margaritic acid* by Dr. Prout and Chevreul. At another time, the contents are very like a ripe medlar, or rotten apple in appearance.

These tumours occur in various situations. Here is a small tumour of fat and hair from the orbit, which is not an unfrequent locality for this genus of congenital encysted tumours, as well as for both the two last genera, and where the operation is sometimes difficult, from the intricate manner in which portions of the tumour sometimes dip down between the muscles and nerves, and where also the cyst is sometimes found attached to the bone. Another very common situation is a cavity in the ovary or broad ligaments of the uterus. I have had two patients with tumours apparently of this kind by the side of the vagina, occasioning a good deal of trouble and pain. One of these I laid open in a pregnant woman, who was to have returned to me, if the tumour formed again, after her confinement; the other suppurated suddenly, after having been five years at least in forming. The most singular kind of tumour, however, of this genus, is when the cyst contains not only hair and fat, where none is naturally found to determine the peculiar growth by its analogy, but has also in it teeth and portions of bone, especially the jaw-bones, or other parts, of a fœtus. They are most frequently found in the ovary, whence this sac with teeth and hair was taken in a patient in this hospital, and of which another instance occurred here very recently, though I know not what became of the preparation, and from this locality they have sometimes been regarded as instances of extra-uterine conception, but on very insufficient grounds, for they are found in other situations also. Mr. Barnes, of Exeter, met with teeth in the orbit, and such tumours have been found in the stomach and bladder; Sir Benjamin Brodie, I think, saw one in this last situation. They are met with in virgins, and in the male sex, and in animals of no sex at all, since Mr. Coleman met with a tumour of this kind in the thigh of a gelding.

Such portions of fœtuses in congenital encysted tumours are not so common,

however, as the other substances I have alluded to, and I should have little doubt that they are examples of double conception, *i. e.* of an imperfect foetus united with or enclosed in another, of which many instances are on record, from the nearly perfect foetus found in the abdomen of a boy by Mr. Highmore, to the cysts containing one or two teeth, or a little hair and fat. There is here a plate from Cruveilhier of a tumour with hair and fat; the hair is unravelled, and you may see that it has been attached to what seems to be a portion of scalp at the side of the cyst. In other cases you do not find any substance from which the hair grows; and with regard to the other peculiar contents of the cysts which I have placed in this genus, it is possible that I am wrong in classifying them thus, and that they should only be looked upon as some peculiar change in the secretion of the serous encysted tumours. If this be so, of course the genus of congenital encysted tumours must then be confined to those which evidently contain such substances as appear to be part of a foetus. Even in the latter case, however, you will understand that although the rudiments are thus commenced and attached in the foetal state, they need not be large at the time of birth, nor become much developed till long afterwards. Being connected with vessels to the part of the body in which they reside, some accidental circumstances may occasion an increased supply of blood to the part, and cause them to lose their stationary condition, and become rapidly increased in size; such, for instance, as the altered condition of the ovary at puberty or during pregnancy.

Whether I am right or wrong in thus bringing into one group all the kinds of cysts and their contents, which I have now enumerated, is not of much consequence, however, since I know not how you could always distinguish them from the two former genera till after the contents have been evacuated, or the cyst dissected out. You can perhaps ascertain the existence of an encysted tumour; but even this must depend upon the circumstance I have before spoken of with regard to the former genera; the quantity and consistence of the secreted materials—the mixture of solid matter—the thickness and distension of the sac, and so on. Nor is the perfect diagnosis of the tumour of much consequence in practice, since nearly the same circumstances which I formerly dwelt upon should guide us, I think, in our treatment of these. In some few, where the nature of the contents, the thinness of the cyst, and the connections of the tumour with the surrounding parts, render it favourable or desirable to do so, we may try the puncture of the sac, with a view to its obliteration by adhesive or suppurative inflammation; but the greater number, where accessible, are best treated by excision of the whole tumour, either entire, or by dissection of the cyst after the previous evacuation of its contents.

In some cases, where excision is inadvisable from the connections of the

cyst, we may, as with the serous encysted tumours, where simpler means fail, attempt to destroy the cyst by nitric acid or potassa fusa. In other cases, again, all operations are out of the question, and we are obliged to content ourselves with warding off as much as possible the consequences of the growth of the tumour, without trying measures which would be impossible, or too hazardous to be thought of with prudence and justice to our patient.

I.—5. *Bursal Encysted Tumours.*

The next genus of encysted tumours on our table are the bursal. These take place sometimes in the bursæ and their secretions, either as the consequence of pressure and inflammation, or else without our being able to trace the cause of certain changes, by which tumours are formed, not curable by the usual means suited to inflammation, but requiring the knife of the surgeon. Instead of synovia and the secretions of inflammation in such membranes, you have semi-fluid matter, like currant-jelly in colour and consistence, or otherwise altered; or masses of solid matter like melon-seeds, as in this preparation; and the cyst, instead of its usual structure, becomes, as you may see here, thick and fibrous, and the cavity is sometimes obliterated, so that a large solid tumour is formed.

In such cases the changes are so considerable, and the treatment required so different from what is necessary for inflammation of these textures, that they may not be inappropriately designated bursal encysted tumours. I shall not at present describe them, however, but leave them to be spoken of with the other diseases of the joints and bursæ, and shall content myself with observing, that when you meet with tumours containing more or less fluid, in the known or probable situation of the bursæ mucosæ, you should generally attribute their formation to these textures; and the recollection will assist your diagnosis in many otherwise obscure affections.

LECTURE III.

- II.—OSSEOUS TUMOURS: 1. Tumours of or upon the Bones.—2. Conversion of natural Textures into Bone.—3. New formations of Bone: (a) Osteo-cartilaginous Tumours; (b) Osteo-steatomatous Tumours; (c) Osteo-sarcomatous Tumours.
- III.—SARCOMATOUS TUMOURS: 1. Adipose Tumours: (a) Common Adipose Tumour; (b) Adipose Tumour with reflected Cyst; (c) Cutaneous Adipose Tumour; (d) Hypertrophy of the Adipose texture.—2. Fibrous Tumours: (a) In fibrous texture; (b) In cellular texture; (c) Painful sub-cutaneous Fibrous Tumour.—3. Neuromatous Tumour.

II.—*Osseous Tumours.*

As a second order of tumours, we will take those in whose structure more or less bone forms an element, and we will call them *osseous tumours*; and the circumstances in which bone is found in unusual situations are chiefly these:—

- II.—1. The most frequent situation, as you would naturally anticipate, for

a bony tumour to be found, is upon the natural osseous structure; the nature of all tumours, as we have seen, being in some measure determined by the texture in which they arise. But I shall not say anything at present upon this subject, which we will leave to be considered with the other diseases of the bones.

II.—2. Another mode in which bone is deposited, so as to constitute a tumour or otherwise to be perceived in examination, is by *ossification* of the *natural textures*, and chiefly of the *fibrous tissues*. Here is a mass of bone in the falx cerebri, where it is not unfrequently met with as a cause of epilepsy, or of an incurable tic-doloreux; such was the case, for instance, in the late Dr. Pemberton. Here again you see the conversion of the fibrous covering of the spleen below the peritoneum into a thick layer of bone: such is seen occasionally in the pericardium, beneath its serous layer, or on the surface of the liver or lung. This is a specimen of the conversion of ligament into bone in the anterior longitudinal ligament of the spine, constituting a singular kind of ankylosis between the vertebræ. It is not infrequent in over-worked horses; and Sir Charles Bell relates a remarkable case, in which a man, subjected to an injury of the spine, broke across this bony splint which he happened to have, and which was, of course, less able to resist injury than the elastic structure whose place it supplied. In elderly persons, tendons and muscular fibres are sometimes converted into bone; as, in this instance, of a portion of what should have been the tendon of the psoas magnus. In the late Mr. Heaviside's museum was a preparation where the femur was arched over by a great number of bony spiculæ, occupying the situation of the vasti muscles. These cases constitute a kind of exostosis not usually productive of much inconvenience, because the morbid growths occupy the places nearly of the muscle or tendon, so as only to shorten their point of attachment, without preventing the action of the muscles, and without interfering with other textures, and because the change is seldom produced to a great extent.

Unless we could discover the elixir vitæ, and realize the dream of our ancestors, and make our patients young again, I know not how we are to check this instance, among many others, of the gradual failure of their corporeal frames. There is occasionally, however, a similar disposition to ossific deposit exhibited in early life, which constitutes a very serious disease, in which ligaments, tendons, and muscles are all implicated. Mr. Abernethy met with a boy in whom the tendency to ossification was so strong, that besides exostosis, the least blow produced the ossification of numerous soft parts;—in the ligamentum nuchæ, so that his head was fixed; and in the margins of the axillæ, so that his arms were pinioned to his side. In the College of Surgeons is a skeleton in which this disease is seen in a remarkable degree, the most extensive ossification of muscles having taken place.

among others of the long muscles of the back down the whole spine, so that the unfortunate subject of this affection must have been a wretched cripple. It would seem that the use of acids, to prevent the deposit—of the nitro-muriatic bath, as it used to be called, and other remedies, have been tried in vain to check this peculiar condition of the system, whatever it may be.

In one of the numbers of the *Medical Gazette* is the description of a curious example of the ossification of muscle, or formation of bone in them, said to be common among Prussian recruits, and known familiarly among them by the name of the exercise bone; though I am not aware that it is observed among our own troops. It is the formation of a bony tumour, or ossification of the fibres of the deltoid and pectoralis major muscles of the left side, where the musket rests. There takes place a small red painful spot, which, if neglected, terminates in the formation of a mass of bone, from four to seven inches long, and weighing from two drachms to an ounce; the excision of which becomes necessary, to get rid of this curious result of inflammation.

II.—3. The third genus of ossific deposit consists of those cases in which ossification takes place in *new situations*, not upon the bones, nor occupying the place of the original textures, but as an entirely *new formation* among soft parts; and you may divide them into three species, according to the kind of soft substance usually mixed with the bone.

a. Osteo-Cartilaginous Tumours.—These are usually met with in the serous membranes, where, after a time, they lie free, like the loose cartilages of the joints, and they are formed in the same manner, no doubt. Here is a small one, which I took from the tunica vaginalis testis, and you can distinguish a solid hard nucleus of bone enclosed in a firm close cartilaginous texture, and covered by a smooth surface of serous membrane, derived from the membrane to which it was originally attached. I had a patient, not long since, with excessively irritable testis, which resisted all the usual remedies, and which I believe arose from a body of this kind, which I wished to remove, but could not persuade the patient to submit to it. You may see in this preparation a large irregular mass of bone, which was mixed with very little semi-cartilaginous matter, and which was formed in an ovarian cyst, from which several other pieces of the same material came away.

b. A second species of osseous tumour consists of a bony cyst, with matter of different kinds in its interior, frequently fatty substance, or a glairy mucilaginous fluid. It is called by some *ostea-steatoma*, from the former secretion. You may see this large bony cyst, which I took from the dissecting room, so that I do not know its history, the contents of which were of this kind; it is attached to the testis, which is perfectly sound and natural at its upper end. You will understand by this situation that it is perfectly distinct from the sebaceous encysted tumour, with steatomatous contents;

but I believe it is frequently only the sequel of the serous and hydatid encysted tumours, the cysts being, in these cases, changed into fibrous texture, and ultimately into bone, partly or entirely: look, for instance, at this large osseous cyst in the liver. I have not one to show you in the common cellular texture, nor are they often met with. You may see this plate of a large one on the cheek in Alibert's splendid work, which he says was unconnected at first, but became subsequently attached to the upper jaw, and required removal.

c. The third species of osseous tumours may be called *osteo-sarcomatous* tumours, as the name has been used by surgical writers, though it is not a very good one, and they consist of a mixture of bone with solid substance, not attached to any of the bones of the body. Here is a large mass of fibrous tumour, or fleshy tubercle, looking like a child's head, and completely filling the uterus, all the outer part of which is bone, so thick as to require a saw to divide it. They are occasionally met with in the external parts of the body, though not commonly. I recollect assisting Sir Benjamin Brodie in removing a bony tumour, mixed with soft substance, from the situation of the parotid gland, where such a structure is occasionally met with. I believe the disease returned. Mr. Abernethy saw one of considerable size in the ham. There is somewhere in the museum, but I could not find it just now, a very large tumour with bone in its interior, which was removed from the inside of the thigh, by a surgeon (not in this hospital), in which case, I believe, the patient died of hæmorrhage on the table, or immediately after the operation, from its involving the great vessels of the thigh.

I am inclined to believe that the loose unattached osteo-sarcomatous tumours, like the tumours of the same name attached to the bones, are of two different kinds; in one of which there is bone formed on the outside of some innocent solid tumour, generally of the fibrous kind, which may be removed with safety when accessible, or a limb removed, if the dissection of the tumour is impracticable, without any fear of the disease returning; while, in the other form of tumour there is a small proportion only of osseous deposition, and this is found chiefly in loose spiculæ distributed through the substance of the tumour, which is of the nature of fungus hæmatodes; consequently, although an operation is equally proper to be performed, it is done with much less confidence, on the part of the surgeon, that the operation will be followed by a successful result. I amputated the thigh for this large malignant disease of the knee-joint, originating, as it seemed, in the ligamentum patellæ, which was of the cerebriiform kind, mixed with bone, and which had ulcerated so as to bleed profusely. The patient died a few days afterwards of copious vomiting of blood, which came not from an internal tumour, as I was inclined to suspect, but from some disease of the vessels of the

stomach and bowels, distending them with blood, and causing their coats to give way.

In all cases of osseous tumours, except the malignant form, in which the soft substance predominating may obscure the diagnosis, there is no difficulty in recognizing the structure by the feeling conveyed by its solid, firm, unyielding material, which is perceptible even at a considerable depth ; and there is, of course, no chance of any cure of an osseous tumour, except by its entire removal by excision or amputation.

III.—*Sarcomatous Tumours.*

The third order of tumours are the *Sarcomatous Tumours*, meaning, as was formerly explained, such new formations as are firm and solid to the touch, not consisting of a single cyst, like the encysted, nor of bone, like the osseous tumours ; or, at least, if either cysts or bone are found in them, these appearances bear a very small proportion to the bulk of the solid materials of the tumour. We may adopt a division of them, from the variety they present, into eleven genera, some of which are innocent, others of a malignant character ; and the principal circumstance to determine, in their investigation, is whether they are or are not malignant, in order that, in the former case, their removal may be earlier effected by the knife ; for unfortunately we shall find, as we proceed, that there is scarcely any one of them which admits of being removed by remedial means independent of an operation.

III.—1. The first genus is the adipose, or *fatty tumour*—*adipose sarcoma*. It is a very common kind of formation, and requires, therefore, to be fully understood by you ; and let me observe, that it is sometimes called lipoma—a bad name, since it is employed also for other formations ; and steatoma, as in the late work of Dr. Warren—a bad name also, since it is more frequently used to designate one of the sebaceous encysted tumours. It is called, too, cellular tumour, as by Mr. Burns ; and this is as injudicious a term as the others, since it is not formed of the cellular texture at all, but of fat in its appropriate cells. There are three species of adipose tumour ; the first of which is,

a. The *common adipose tumour* ; which consists of a mass of fat, rather whiter and firmer than ordinary, and of a closer texture, which is enclosed in a thin cellular membrane, separating it from the surrounding fat, and dipping into its interior, so as to divide the tumour into a great number of lobes. The membranous cyst, is very loosely connected to the bed in which it lies, except at one point where a vessel or two enter it, or if long, the vessels supply it at two or three places. Its vascularity is very slight, however, so as hardly to bleed if it is cut. You saw yesterday a tumour of several ounces weight removed from the shoulder, irregularly shaped, and lobulated ; and I have seen it sometimes almost like a bunch of grapes in

shape. Fatty tumours are found chiefly, as you would expect, below the skin in the common adipose texture, and they are common on the back, or thighs, or chest. It is said they do not occur in the eye-lids or scrotum, where there is no fat; they have, however, been met with in the scrotum, though of necessity very rarely. They sometimes attain a great size. I have seen one, removed by Sir Everard Home, weighing 26 lbs., and one of 40 lbs. has been removed. They arise from a blow, or other injury, sometimes; but more frequently without any evident cause. Sometimes, after growing to a certain size, they remain stationary, and undergo no further increase; and whatever size they attain, they generally produce little pain or inconvenience, except from their bulk, dragging thus upon other textures, and being, of course, very unsightly. Here is a small fatty tumour, however, which occasioned very great pain, from its having accidentally a small nerve stretched over it. Occasionally, however, when large, the skin becomes distended over them, and ulcerates, and the tumour projects, with an unhealthy fungus growing from it, of apparently a bad character, though not really malignant. Here is a small one, ulcerated, and it shows you the yellowish-brown colour which the fat then acquires. Rarely is any inflammation established in a fatty tumour, but Sir Benjamin Brodie met with one case in which the centre suppurated, and matter formed, mixed with oily substance from the tumour.

The diagnosis of a fatty tumour is generally very easy; it is unaccompanied with pain; it is soft and elastic, with a peculiar feeling to the touch that you can seldom mistake after having once felt it, and is different from that of every other swelling, except sometimes the subcutaneous nævus, the vascularity and colour of which are usually apparent, and except sometimes a small deep chronic abscess, where the matter is too thick, or too small in quantity, to be rendered sensible by fluctuation, which is very seldom the case; and such an abscess is less elastic and less moveable than the fatty tumour. Medicine has no influence on this tumour, nor have any local remedies power over it, except to do harm. You may often see the tumour after stimulant plasters or blisters have been applied; and the consequence is adhesion to the skin, making dissection necessary in the operation. Pressure also by the clothes, or by other means, induces sometimes the same adhesion, and makes the operation more difficult.

The operation is generally very easy and very safe, and union readily takes place afterwards, in most cases, where no inflammation has preceded it, and the skin has not been rendered thin by pressure and tension.

If the tumour is small and stationary, and not in an inconvenient situation, no operation is absolutely necessary; but it is generally better to do it as soon as the patient consents, as it is so much slighter an operation when small, and, if left, it may grow to a considerable size, or it may inflame, or

become of a different character at some future time. The operation is best done by a simple incision through the skin, cutting through the cellular covering of the tumour into its substance; you are then certain of the boundaries of the tumour, and you can readily separate the attachments of the cyst by the fingers, so that you have nothing to cut through except the vessels at its base, and, as we have seen, even a large one will hardly have more than one or two requiring to be tied; you will then bring the skin together, and make pressure over the sides of the cavity from which the tumour has been removed, by plasters and bandages. If you try to dissect round the tumour without cutting into the cyst, you are very liable to leave a portion behind for the tumour to be re-formed, and you will have much more hæmorrhage, especially if the tumour is attached to muscles. If it is torn away, on the contrary, you are sure to remove every portion, even of the most lobulated form of tumour, from the cavities in which the several portions lie. If there is adhesion of the skin to the cyst, you are sometimes obliged to dissect off the skin, and then you can tear away the rest of the tumour; and if the tumour is very large, and the skin is thin or ulcerated on the surface, a portion of it may be removed, by a double incision, with the tumour.

If an adipose tumour is situated under a fascia, its diagnosis is more difficult, as it loses much of its elasticity, and feels more solid, or sometimes more like an abscess; but directly an incision is made through the fascia, the tumour starts out, and can be easily torn away. If the tumour has been subject to much pressure, however, the operation becomes more difficult, from the necessity you are then under of using the knife, which is to be done with caution, in order to distinguish the fat of the tumour from that around. A gentleman with whom I am acquainted had a fatty tumour on one side of the nates, which an eminent surgeon advised his doing nothing to. He followed this advice rather longer than was intended, I presume,—namely, for twenty years; at the end of which time it was very large, and could not be concealed in his clothes, and was a somewhat inconvenient cushion to sit upon; in fact, he hardly liked to stir out. He came to town while I was absent, so that I did not see him, but the tumour was removed by Sir Benjamin Brodie, who informed me that the pressure to which the tumour had been subjected had pushed it deep even into the sciatic notch, and had produced a good deal of adhesion to the important parts there situated, making the dissection both difficult and dangerous.

There is a singular situation in which the fatty tumour is sometimes found—namely, in the fat below the transversalis abdominis: one such case I saw in this hospital, removed safely by Sir B. Brodie. The tumour here makes its way through the abdominal muscles, so as to be perceptible externally, and has been called, erroneously, a fatty hernia (*Hernie graisseuse*). It

requires caution, however, in the operation, as it is sometimes attached to the peritoneum, and this membrane may be dragged out and endangered, if unattended to.

b. A second species of adipose tumour possesses a reflected cyst. The common fatty tumour has an entire membranous covering, but the one I am now alluding to has a loose reflected bag around the other, and connected with it at the base, like the two layers of the pericardium. The tumour, in short, has no attachment except where the vessels enter, and the surface is smooth, instead of the rough cellular connection which it usually possesses to the surrounding fat. Here is a small tumour, said to have been of this kind, but it is rare, and I have not seen it in the living body. I suppose, however, there is no apparent distinction between the two forms before operation, since no fluid is secreted between the attached and the reflected layers of the cyst. In fact, I should regard it as a mere accidental circumstance, such as I have sometimes seen with nævi and other tumours which usually are attached all round. The operation must be equally necessary as in the other case; and I presume the loose cyst need not be removed, since it has nothing to do with the formation of the fat of the tumour, and is probably no more capable of reproducing the tumour than the less organized cellular membrane attached to the cyst of the common adipose tumour.

c. The third genus I call the *cutaneous adipose tumour*. In this preparation you may see a great mass, of half a pound weight, attached to the body by a very narrow pedicle, from which it hung loose on the skin, and which was cut through, leaving a surface of not more than a third of an inch for a tumour nearly four inches in diameter. It is composed of a thicker kind of fat than usual, whiter and firmer, more lardaceous in appearance, and it is covered only by a thin white skin, without any natural fat below it, and scarcely capable of being dissected off, from fibrous bands running from the cutis into it. There are sometimes a great number of these tumours attached to the skin, and connected with it; and from their whiter and more solid appearance they may be mistaken for medullary tumours of this structure, especially when, after having removed one or more of the little tumours, you perceive others rising near the cicatrix perhaps. This form of disease is not well described anywhere, and from the resemblance to malignant disease in the circumstances I have mentioned, you must bear it in mind. In this plate of Alibert's, under the name of *loupes graisseux*, is what appears to have been a case of this form of disease, since you seldom see such an immense number of the common adipose tumours. It is not a common form of tumour, but I have known it subside under the use of liquor potassæ continued for a great length of time, which I have combined with sarsaparilla in one person of a weak constitution. Of this medicine you may give from half a drachm to a drachm three times a day. I think a

little benefit might be derived from the local application of a solution of iodine and hydriodate of potash, such as you see used in the hospital occasionally ; but I have not tried it. If this medicine does not disperse the tumours, any one of them that is growing faster than the rest may easily be removed by the knife ; or, if there is only one, the patient may have the choice of its removal at once by this means, and a shorter course of medicine afterwards, to lessen the chance of a return.

d. Another form of adipose growth may be called *hypertrophy* of the adipose texture, in which there is a vast increase of fat below the skin ; but the fat has no boundary, no cyst, as in the former genera. Sometimes there is only a general growth of fat in all parts of the body, as in this plate of a child, making the unfortunate object of it quite unwieldy, and seriously incommoding him ; but this is only common obesity in a remarkable degree. At another time, however, the fat of a particular part of the body only increases in this manner, and this is generally of the chin, where you may sometimes see an enormous bag of fat, as large as the head, which might well be called a tumour, though not quite in accordance with the definition before given. Sometimes, instead of being on the chin, you see a great mass hanging on the front of the abdomen, or some other part of the body. In a man now in the hospital under my care, many of you have seen a remarkable specimen of this tendency to adipose hypertrophy ; at least, I believe it to be this form of complaint rather than the first genus. This man has two masses of fat on the back of the neck, each as large almost as your double fist, the division having been, in fact, made by the pressure of his neckcloth. Another great mass hangs below his chin ; he has another over each deltoid muscle ; and on the abdomen is a large quantity, divided into the appearance of two tumours by his waistband ; besides which he is tolerably fat every where, so as to form altogether a remarkable figure.

Such tumours as these do not admit of removal by the knife, since there is no distinction between the increased mass and the rest of the fat ; but, as it is a constitutional disease, it is capable of being remedied by medical treatment, and the masses of fat disappear under the use of liquor potassæ, which you should gradually increase till the patient takes a drachm and a half, or two drachms, three times daily in milk or beer. My patient has taken it now nearly three months, and the tumours, though not obviously lessened, are considerably less full, and the lobules are more distinct where the cellular texture divides the separate portions ; but it requires to be continued for nearly a year, I believe ; and from his having epilepsy and rheumatism, the medicine has hardly yet had fair play. I recollect, when a pupil, a servant who was in attendance at the hospital for a great mass of this description under the chin, which was so unsightly as to prevent the man from gaining his livelihood ; this man took the potash for a year

I believe, and the fat at last disappeared, leaving an empty loose bag of skin ; and I mention the case because Sir Benjamin Brodie, whose patient he was, informs me that he was accosted ten or eleven years afterwards by a servant, in a house which he was visiting, who proved to have been this individual, and who had remained quite well since, the redundant skin having, of course, contracted. Wherever, then, you have several masses of fat of this kind, try this medicine in the large doses I have mentioned, for a considerable time. How it acts I don't know, unless it forms a kind of soap in the body. It generally produces some degree of universal emaciation after a time, by its effects probably on the stomach ; but the effect is evident in a much greater proportion upon the tumours than upon the rest of the body ; and this general thinness is recovered from, as it would seem, without reproduction of the fat. Sir Benjamin Brodie once tried iodine in this kind of disease ; but although it caused the usual emaciation which that medicine creates, it did not influence the local deposit of fat, which increased notwithstanding the general falling away.

III.—2. The second genus of solid tumours is the *fibrous tumour*, which may be subdivided into three species.

a. One form of fibrous tumour is connected with *fibrous textures*, such as fascia, ligament, dura mater, and the contractile fibrous tissue of the uterus. A common situation is on the fasciæ, under the skin, in the arms or legs. Here is one which I removed from over the annular ligament of the instep. I have seen three or four, in the same person, on both fore-arms ; I have seen it also in the thigh, arising from the fascia lata, and on the back of the hand.

Examine the tumour, and you find it from any of these situations hard, whitish, semi-cartilaginous ; the knife cuts it with difficulty, like a cancerous tumour ; and it cries, as the French call it, when cut ; it is, in fact, just like a mass of firm condensed ligament, in a circumscribed and generally a circular form. To distinguish it below the skin, you will feel it hard and firm, nearly unattended with pain ; moveable, except at the point of attachment, which is easily perceived ; possessing little elasticity, smooth on the surface, and the skin generally moving freely upon it.

When increasing, the tumour may easily be removed by the knife ; but you must be very careful to remove not only the tumour itself, but the whole of the fascial or ligamentous structure to which it is attached, otherwise the disease will return. A patient came under Mr. Babington's care for a tumour of considerable size, apparently of this kind, connected with the upper and outer part of the thigh, which had already been twice removed by operation, and which, I believe, was perfectly innocent in its character, and thus returned from want of attention to this circumstance in the former operations. There is often no necessity, however, for operation, if the

patient is unwilling to have it performed, as the tumour is very slow in its progress ; for instance, a man came under my care for some other cause, in whom, over the edge of each radius, a tumour of this kind existed ; but although seven or eight years had elapsed since their first formation, they were not so large as a walnut, and he had no inconvenience from them, and would not, therefore, have them excised.

Fibrous tumours of the dura mater of the spine, or brain, are somewhat softer, and more yellow in texture, and produce of course the symptoms of pressure, but very slowly. I have seen the spinal marrow compressed to half its natural diameter. It is unnecessary to dwell upon them, however, from their incurable nature.

The *fibrous tumour of the uterus*, or *fleshy tubercle* of this organ, as it is also denominated, is very common, and is generally, like the structure of the uterus itself, a little condensed ; it is consequently considerably less ligamentous than the former varieties. They grow in this situation in any direction ; here is a section of one which I found filling the uterus, which was thinly expanded over it ; it was nearly as large as a child's head, and the surface is a mass of firm bone, which required the saw to divide it. You may see them projecting into the pelvis and abdomen, covered by peritoneum. I once saw one larger than any one's head, which had been removed by operation. The operator who showed it me very naturally expected to find a diseased ovarium in a moveable tumour of this magnitude, and the patient as naturally died of peritonitis. There is a long paper by Dupuytren, on the Fibrous Tumour of the Uterus, and a complete account of them by Dr. Lec, in the 19th volume of the Medico-Chirurgical Transactions.

When situated towards the interior of the uterus, they project into the cavity of that organ, and into the vagina ; and when accessible, they may be removed by the double canula, or by excision, but not so easily as the ordinary polypus. The operation is not, however, devoid of risk ; for instance, in the present year I had a woman under my care, with a tumour of the size of the fist in the vagina, with a neck an inch and a half wide. I tried to bring it down so as to excise it, but could not do so without more force than I liked to employ, and therefore tied it with a ligature. The mass separated by ulceration ; but when the patient was apparently getting well, a low inflammation spread to the uterus, and to the peritoncum, and destroyed her. I found on examination, that besides the mass which I had removed, and which was attached by its neck to one side of the cervix uteri, another, which had met with less pressure and resistance in that direction, had enlarged to the size of the fist within the cavity of the uterus. They are fatal by irritation and hæmorrhage, in some cases, without operation. I attended a woman with Mr. Malton lately, and removed a polypus from the cervix uteri by excision, but was obliged to leave a fibrous tumour

distending the cavity of the uterus, which proved fatal a few months afterwards. When of very large size, a change takes place occasionally in the interior, and the tumour becomes very vascular, and ulcerates, so as to look like a malignant tumour, as in this drawing from a patient of Dr. Seymour's, who died in the hospital, with this immense tumour hanging down in the vagina, and connected with the fundus of the uterus.

b. A second form of fibrous tumour seems to originate in the *cellular texture*; it is somewhat similar to the last, but much softer, and more elastic, the fibres softer and less distinct, and not so white and shining; and it contains some fluid, which exudes on a section being made, and thus leaves the tough fibrous cellular membrane, which composes the solid part, to a certain degree flaccid. It is smooth and elastic in the living body, little painful, and grows to a considerable size sometimes. The most frequent situation in which it is met with seems to be in the cellular texture, by the side of the vagina, perhaps from the stronger and more fibrous nature of the cellular membrane in this situation. Here is one of several inches length, which I saw removed by Sir Benjamin Brodie from this situation, which it was difficult to extract entire, from the great depth to which the end dipped into the pelvic cavity. This circumstance makes the operation difficult, and requires care in the dissection; but its nature seems to be innocent, so that it does not return if the whole tumour be extracted from its cellular bed. A very remarkable case has been published by Mr. Lawrence, of this disease, which he calls a cellular tumour; but as it contains no cells, and is tolerably firm in structure, I think the name fibrous tumour of the cellular membrane less likely to be misunderstood. In this case the tumour had grown for four years, was thirty-two inches in circumference, and was as large as a double head; it returned after the first operation, from the end being cut across; and a second operation being performed two years after the first, this end was dragged out of its deep situation, and the disease did not return again.

This tumour must not be confounded with a peculiar growth of the labia and nymphæ, which will be described to you by-and-bye, a kind of hypertrophy only of the cellular membrane, which becomes distended to a great size; this is a disease of the same kind as that which is called the Barbadoes leg. The fibrous tumour has, on the contrary, no connection with the skin, and is hard and firm.

c. The third species of tumour in this genus may be called the *painful subcutaneous fibrous tumour*, or, as it was called originally by some English authors, *painful subcutaneous tubercle*. The best description, however, of the disease, is by Dupuytren, who remarks that it has been erroneously called a nervous tumour, and who calls it himself a fibro-cellular tumour. It contains no cells, however, as this name would seem to imply, and is really a fibrous tumour, with a singular painful sensation.

It is observed 'as a little hard lump below the skin, the size of a grain of wheat, perhaps, and never more than as large as a pea or small bean ; you have seen me lately remove one of seven years' growth, which was even then not half as large as a small pea ; I could not find it this evening to show it you, though it is somewhere in the museum. Its texture is firm and fibrous, sometimes almost like cartilage in hardness, whitish, or brownish white, and with a rather firm covering. It is exquisitely tender, the least touch exciting violent pain ; even the passage of cold air over it, or the friction of the clothes, may produce complete torture. The pain is sudden, darting, like an electric shock ; sometimes so severe and frequent, as to induce convulsions, and become quite wearing and injurious to the general health. I amputated the leg of a man this year, who had one near the tubercle of the tibia, and the pressure of the wooden leg after the operation obliged me to remove the little tumour, from the pain which was produced by it, and which seemed to extend over the whole side. Sir Benjamin Brodie not long since removed one from the cheek, in which situation they are not uncommon, though they may be met with anywhere. You can scarcely account for the production of such violent pain in these little tumours ; occasionally, indeed, you can trace some nervous twig into them, or over them, but very often you will look in vain for any distinct fibre of nerve. Dupuytren attributes the pain to the density of the kind of capsule which surrounds the tumour ; but this is by no means always met with ; in the one I have just alluded to, the capsule was rather delicate, and there was a reflected cyst besides, which, like a bursa, must have still further defended the tumour from friction ; in this case, by-the-bye, the pain was only occasioned by pressure in one direction, which dragged probably on a nerve.

The skin is generally loose and moveable, but is sometimes attached to the tumour. It may occur from falls, or blows, or other injuries, but often takes place without any evident cause. Dupuytren says that women are more subject to it than men : it so happens, as to myself, that I have only seen it in the male sex ; but yet he may be right. There is scarcely ever more than one in the same person. The only disease for which it can well be mistaken is *tie douloureux*, the pain being similar in the two cases ; but the existence of the little tumour, and the production of pain by pressure, easily serve as diagnostic marks between them.

Narcotics and various other remedies have often been tried for a great length of time, without any avail, and the removal of the little tumour by the knife is the best remedy, which is also generally easily and safely done, though some of you have seen extensive abscess follow the operation in the recent case of my own, which I have alluded to before. You may make an incision through the skin over it, and catch hold of it with a hook to cut it out. Dupuytren gives an additional reason for the operation ; viz., the

tendency of the tumour to become cancerous, and end in carcinomatous ulceration. I think he is probably not correct, however, as to their having any natural tendency of this kind; all tumours no doubt may become changed into cancer, but certainly very many years will elapse without any alteration. The operation is, however, right, for the pain produced by the tumour, whether Dupuytren be correct or not as to its probable termination.

III.—3. The third genus of sarcomatous tumour is really a tumour of a nerve, or rather in the coverings of a nerve, and you may call it the *neuromatous tumour*. It is not common, however.

a. Sir Everard Home has given a very good description of one that he removed in this hospital from the axillary plexus. The tumour was situated in the texture of the nerve, between its fibres, and was of a tolerably firm consistence, with a mixture of fluid of a white or light brown colour, and the nerve was flattened into two portions by the separation of its fibres. It was firm in its feeling; and after growing slowly for several years, it had increased more rapidly. It could be moved laterally without pain; but if dragged upon, violent pain was produced in the course of the nerve. A small cord could be felt at each end of the tumour, which was the continuation of the nerve, and the neurilema of the nerve formed the covering of the tumour. Dr. Gills, who was house-surgeon here, I believe, and who paid us a visit not long since from St. Petersburg, where he resides, removed another from the muscular spiral nerve, the fibres of which were more reticulated and expanded, and the fluid in the centre was dark-coloured, like blood. In the removal, a large artery in the centre bled freely. The return of sensation and motion took place here slowly; but you must be prepared, if such a case presented itself to you, for the patient suffering great inconvenience for a long time, from want of nervous power, and should not be in haste to operate.

The situation of the tumour, its connection with a nerve above and below, the peculiar pain and nervous symptoms in the parts supplied by the nerve, will form grounds for an accurate diagnosis; unless, as I have seen, a tumour involves a nerve in its structure, in which case it may erroneously appear to have originated in the nerve.

I apprehend such tumours are of the same kind as what you may see in this preparation, and which frequently thus form in stumps, and occasionally require a second amputation, from the severity of the pain; or such as you may examine in this preparation formed in the median nerve after an apparent injury which divided the nerve into two portions. The tumour is on the upper end of the nerve, and when recent was two inches long and one broad. In this case, too, the power of the part below seems to have been restored by anastomosing branches between the muscular spiral nerve and the lower end of the median.

Such tumours do not appear to result from common inflammation, which only thickens and condenses the cellular texture and neurilema of the nerve, but they seem rather to arise from some peculiar action, by which a fluid is effused between the fibres of the nerve, with a cellular covering. And judging from what is seen after amputation, there is probably a peculiar condition of the nervous system, that would make one indisposed to meddle with the tumour, if it can be avoided. The loss of motion, sensation, and vital properties, is of serious consequence; and in one case of tumour of a nerve, in which Sir Everard Home operated, the patient died on the fifth day afterwards, with violent nervous excitement, after the small nerve had thus been cut through in which it was situated.

b. The case, however, which I have just alluded to, was a tumour of a different kind from what I have been describing. It was one in which he found that the tumour was an encysted tumour, which could be turned out of its bed in the nerve, leaving the fibres uninvolved. And it would appear from preparations which I have seen in the College of Surgeons, and elsewhere, that a variety of tumours may possibly be met with of a fibrous or other character, merely situated in a nerve, and not deriving any peculiarity from that locality, and which probably cannot be distinguished from the neuromatous tumour till a dissection of the parts is made. But I can say nothing on this subject from my own experience.

LECTURE IV.

SARCOMATOUS TUMOURS (*continued*).

4. Conglomerate or Pancreatic Tumours.—5. Conglobate Tumours: (*a*) Simple Conglobate Tumours; Tumours in the Parotid Gland; (*b*) Tubercular Conglobate Tumours.—6. Scrofulous Tumours.—7. Cystic Tumours.—8. Tuberos Cystic Tumours; Circumstances in which Cysts are met with in Tumours; Theories with regard to Cysts in Tumours.

III.—4. The next genus of sarcomatous tumours we will call the *conglomerate tumours*; by which term I mean to designate the kind of tumour which Mr. Abernethy has termed *pancreatic*, *i.e.*, a new substance, consisting of numerous small portions, each resembling the rest, and the whole bearing some similarity of appearance to that of the pancreas or salivary glands. Some tumours, however, of apparently the same kind, consist of much more minute elementary particles, more like the acini of the liver in size, than the separate portions of the salivary glands; and I therefore prefer the name *conglomerate*, implying, as with the conglomerate glands of all kinds, that the tumour is composed of a great number of similar elementary portions firmly joined together, so as to compose one mass.

This tumour possesses a firm texture, it is of a whitish colour, and it has a little vascularity; it has a general coat or covering of cellular membrane, from which it may be dissected, or pulled out, so as to show as in this

preparation, the separate portions of which it is composed ; and on making a section of the tumour, it has a granulated appearance, which is here very distinct, from the number of packets which are cut across ; and in some, which are softer than others, you can squeeze out the granular bodies from their cellular beds. They sometimes attain a considerable size, as in this case, where the tumour is six inches in diameter ; but in other cases the growth of several years may not be larger than a marble.

When the tumour is tolerably large, it feels irregular, and lobulated, and hard ; it is separate from the part in which it is embedded, but the cellular connection is sometimes so strong, that you cannot trace its boundaries very accurately. When thus firmly bound down, it feels almost of a scirrhus hardness ; but its more irregular surface is very different from that of a cancerous tumour. There is also no attachment to the skin, unless it be of very large size, and it is moveable upon the deeper parts ; and it generally gives little pain or inconvenience, though this circumstance is not always the case ; so that it sometimes requires a good deal of care to distinguish it from a cancerous tumour in its early stage. If the tumour is composed of smaller elements, it is smoother than usual on the surface, so as to make it in some situations impossible to be distinguished without dissection from the next, or conglobate tumour. It is a disease of middle age chiefly, not appearing to attack children or young persons, and seldom coming for the first time at an advanced age.

Mr. Abernethy supposes that this tumour originates in an absorbent gland ; but it hardly seems to do so, and certainly is, in general, in parts where no absorbent gland is known to exist. Mr. Lawrence conjectures, with apparently more probability, that the conglomerate or pancreatic tumour is a new structure, deriving its peculiar appearance from its being like the structure in which it is situated, just as a bone will give an osseous texture to a tumour upon or near it. If this conjecture be well founded, the conglomerate tumour would be nearly confined to the breast, in which it is most frequently met with ; to the parotid and submaxillary glands, in which it occurs next in order of frequency ; and to the orbit near the lachrymal gland, where it is occasionally, though not often observed. I am not certain, however, that the tumour is really confined to these situations ; for instance, here are some tumours apparently of this nature, said to have been situated near the thyroid gland ; but I do not know their exact history, nor whether they were high enough to be near the submaxillary gland, as well as the thyroid, to which latter structure they have no similarity.

Sir A. Cooper has called this kind of tumour, when situated in the breast, the chronic mammary tumour ; but the term mammary tumour you will recollect, as it is employed by Abernethy and other persons, means a form of growth like udder, rather than what we are now considering, and which

occurs in any part of the body, and is, in fact, a kind of cancerous structure. Dr. Carswell also, in his admirable plates of morbid structures, places the mammary tumour of Sir A. Cooper, *i.e.*, the conglomerate tumour now before us, among the forms of cancerous tumours, as if it were exactly the same as the udder-like tumour. I am myself, however, strongly inclined to believe, that the true conglomerate tumour is not in any respect malignant; I never heard of its returning in the breast, though it is very frequently removed from that situation, and not seldom from the neck also, with perfect success.

You will find in practice that the growth of this tumour, and the pain or inconvenience it occasions, are materially dependent on the general health, and consequently that you can relieve it, and check the rapidity of its increase, by alterative treatment. When painful, a few leeches may now and then be employed, with cold or tepid evaporating lotions; at other times a warm plaster over the tumour is of service; but the subject will be mentioned to you again with the diseases of the breast. When large, or when inconvenient and harassing to the patient, it may be removed with perfect safety, and without fear of a return; and the best method of operating, though somewhat more difficult, is to cut into the cyst which surrounds it, and tear and dissect it out of its bed, this plan occasioning less hæmorrhage, and affording consequently more chance of union, than if dissection is made round the tumour. In the operations for the removal of these tumours from the neck, more difficulty is experienced, and more caution necessary, from the irregular processes which sometimes dip down among the important vessels of this region. Mr. Lawrence has published the particulars of one case, in which the tumour passed behind the pharynx, and between the external and internal carotid arteries, both of which were laid bare, while the portio dura was also divided, so as to cause permanent paralysis; and I mention this case to you as a great encouragement in even extensive tumours, since that gentleman saw the patient five years after the operation, at which time there had been no return of the disease, although the tumour had been of the extent described.

III.—5. *Conglobate tumour*.—As the last genus of sarcomatous tumours is connected with, or similar to, the conglomerate glands, so is the next either situated in, or it resembles, the conglobate or absorbent glands; and I will divide the genus of *conglobate tumours* into two species.

a. Simple conglobate tumour.—This tumour is chiefly found in middle life from the age of 35 to 50, at which time one or two bodies are found, round or oval in shape, firm, hard, or slightly elastic, in the situation of some of the absorbent glands. Not unfrequently it is the sequel of the common scrofulous enlargement of early life, in which case, out of a number of glands somewhat larger than natural, but which have remained perfectly quiet for

years, one or two will suddenly increase and become painful, still being smooth on the surface, but feeling harder and less yielding than they had before been. When cut the tumour shows a firm uniform structure, something like scirrhus in appearance, but still looking slightly glandular. This one was situated behind the mastoid muscle, and I assisted Mr. Keate in removing it from a lady nearly 40 years of age, in whom it had thus suddenly begun to increase; it shows the structure very well. In this preparation is a larger mass, by the side of the larynx and œsophagus, which had obstructed the circulation, so as to induce apoplectic symptoms. After a time, the tumour, having perhaps increased to the size of a cricket-ball, becomes attached to the skin; it ulcerates, and an unhealthy bleeding surface is exposed, which is hollowed out by sloughing and ulceration, while the edges are thickened, everted, and fungous. The health now suffers considerably from the irritation of the tumour; the patient becomes weak and emaciated, and dies with hectic fever, worn out by the pain and irritation and bleeding of the tumour; or perhaps a temporary respite is afforded by the greater part of the diseased mass sloughing away, after which the health is restored for a few months, till the part which is left again increases.

I have said that the tumour looks like scirrhus, and its termination locally is like that of a malignant and cancerous sore; yet I am inclined to think that it is not ordinary cancer, not malignant in its effects upon the *system*, but only *locally* malignant in its influence upon the neighbouring structures. Certainly, at least, the patient has not commonly any scirrhus or malignant disease in other parts of the body, and certainly the tumour may very often be removed without any return of the disease, and that, too, even after ulceration has commenced; and it ought undoubtedly to be removed by operation as soon as its nature is ascertained, whether, on the one hand I am correct in placing it thus by itself as a separate disease, or whether, on the other, it is only scirrhus modified by its originating primarily in an absorbent gland.

The situation in which the conglobate tumour is most frequently met with is in the submaxillary and parotid glands; and in the latter place it is bound down by fascia, so as generally to ulcerate early. Now you will find in surgical writers numerous descriptions of diseases of the parotid gland, for which that gland has been removed by operation. But the real fact is, that the salivary glands are very seldom altered in structure, so as to require removal; and the greater number of the tumours here met with are not enlargements of the parotid glands, but of the absorbent glands attached to them. In general the tumour is therefore on the surface of the parotid, or slightly covered by it; but after a time the pressure of the tumour may cause the absorption of the salivary gland, and the new structure will thus occupy its place. In many of the reports of cases in which the parotid

gland is supposed to have been removed, there is no mention of paralysis of the face, nor of great hæmorrhage, nor of deep and intricate dissection, which almost always present themselves when the parotid itself is intimately connected with the diseased mass; and in many I have no doubt the operators have deceived themselves, and have removed a tumour, which has pushed aside the parotid, when they imagined they were dissecting out the salivary gland also.

Certainly no one should attempt to remove the parotid, or a tumour which has produced absorption of that gland, who is not conscious that he possesses considerable anatomical skill, and the boldness which is derived from such knowledge, for it is undoubtedly a formidable operation. I have seen very good surgeons obliged to desist in the middle of the operation, from the impossibility of dissecting out the whole of the tumour, from its passing below the jaw or behind the pharynx, with an intimate connection with the important arteries, and veins, and nerves of the upper part of the neck. In other cases, on the contrary, the removal of a tumour from this part is an easy operation, and you have nothing to do but to dissect out the tumour from its bed in the parotid gland, without inflicting any injury upon the portio dura or the carotid arteries. Let me caution you, however, not to be deceived by the apparent mobility of this tumour, into a belief that it is superficial, when it is really very deeply situated; for it has occasionally a sort of hour-glass shape, and you can move one half of it freely, while the rest dips down among the important parts below.

There would seem, however, to be several kinds of tumours in the situation of the parotid gland, besides that which we have just been considering. Sometimes there is a serous encysted tumour, sometimes an osteo-steatomatous or an osteo-sarcomatous tumour; and, of the solid structures, you may find a fibrous tumour, or a conglomerate tumour, or a conglobate, or a scrofulous tumour. Now all of these may usually be removed from the parotid safely and with facility early in their growth; they may also be dissected out at a later period, but with more difficulty, from the processes arising irregularly from the chief part of the new growth, or from their connection with blood-vessels and nerves; but still safely, if the whole of the disease is removed. Here, for instance, are some large tumours, which were not followed by any return of the disease after the operation. But with regard to the conglobate tumours, if the least portion of the disease be left, a new tumour is likely to appear in the seat of the operation, and the patient will die of ulceration and hæmorrhage; such was the sequel of the cases from which these two tumours were removed, although they were much smaller than the others which I before showed you. I have seen several, however, in which, on a narrow examination, it was evident that a little piece was cut off in the operation. Still, even in these cases, in which the

disease returns, I believe the malignant action is confined to the part ; that it is local, and affects the textures in contact with the tumour, but does not contaminate the glands, nor the whole system.

But, finally, there are other tumours in the parotid gland, which are really malignant in a higher sense ; which are of the nature of cancer, or of fungus hæmatodes, melanosis, or medullary structure, and in which consequently the disease will in all probability return, as usual, in the glands of the neck, or in other parts of the body, or in the internal viscera.

b. Tubercular Conglobate Tumour.—The second form of conglobate tumour is in some respects like the former, but is yet distinct from it in other particulars. I suppose it is to this disease that Mr. Abernethy gave the name of tubercular sarcoma, and as I wish as far as possible to speak to you in the same language as other persons, I will adopt in this arrangement the term *tubercular conglobate tumour*.

The chief difference in the appearance of this disease from the simple conglobate tumour is, that it begins not as a single mass, but consists of a great number of round bodies, like swelled absorbent glands, more or less joined together ; in fact, they much resemble common scrofulous enlarged glands at first. Here is a cast which I had taken from a boy under my care in the hospital, but from an accidental delay it only appears of half the size it had been a short time before. These numerous round bodies vary in size from a pea to a walnut or hen's egg, and are connected together by loose cellular texture, which inflames from time to time, with a temporary increase in the bulk of the separate round bodies, which then form one uniform mass of an irregular and *tuberculated* figure ; but on the subsidence of the disease, the globular bodies can again be moved upon one another. These tubercles are of a white or light brown colour, as you may see in these preparations, and possess a firm, hard, and uniform texture, not in the least scrofulous in appearance, nor so soft and white as cerebriiform tumours. When hardened into one mass, and increasing much, the skin over the tumour ulcerates, and a painful intractable sore, with fungous edges, is formed, with occasional hæmorrhage, and the patient dies of irritation, with the aspect of a person labouring under malignant disease. I have seen great irritation and emaciation before the ulcerative stage commences, and when situated in the lower part of the neck and mediastinum, irritation of the lungs is produced ; or when around the trachea and œsophagus, ulceration may proceed into those tubes with the usual symptoms of such a connection, as seems to have been the case in the patient from whom this large mass was taken ; and in the abdomen, ascites will result from a similar formation.

The disease may, in fact, occur in any part, though the neck is its most common situation ; as in the glands of the axilla or groin, or along the aorta, in the chest or abdomen. But further, during the progress of the complaint

little round bodies may make their appearance under the skin, in various situations, where no absorbent glands are known to exist. In this boy a great number existed over the front of the sternum and below the clavicles, which disappeared under medicine, while the chief mass in the neck was materially lessened in bulk. I have not usually seen the patients suffer much pain either in the chief tumour, nor in these separate globular tubercles (which by-the-by, are not frequent); but Mr. Abernethy, under this name, describes one case, where the little tumours, which were numerous, were so exceedingly sensitive, that the patient, in describing the pain he experienced, employed the expressive simile of his lying on hob-nails. It would appear, finally, that the disease may exist at any age from ten to fifty, but the few I have seen have been in lads from sixteen to twenty years of age. I have recently met with an observation of Dr. Hodgkin's, in the 17th vol. of the *Medico-Chirurgical Transactions*, in which he mentions several cases of apparently this disease, and remarks that in every case except one he has found a number of little bodies of a cyst-like form in the spleen. I have not myself had an opportunity of verifying this observation since I noticed his paper, nor do I know (if it be well founded) whether the coincidence is of importance or not.

As to the nature of the tubercular conglobate tumour, Dr. Hodgkin quotes a case from Dr. Carswell's valuable work, in which it is called cerebriform disease of the absorbent glands. I agree with Dr. Hodgkin, however, in thinking it a different disease to a certain extent; the tumours are harder and firmer than cerebriform formations, and they run a somewhat different course. I have, indeed, seen cases of fungoid disease of the cerebriform variety, which resembled the disease in question. Mr. Keate, for instance, had an elderly man under his care in the hospital, with a great number of superficial tumours on the head and face and other parts of the body, but they affected the skin more intimately, and were whiter and softer than the superficial subcutaneous tumours of the tubercular conglobate tumour; and in this case the glandular mass in the neck had occurred secondarily by absorption from some of the other tumours, and there were tumours of fungous character in other parts of the body.

Still I am inclined to look upon it as to a certain extent a modification of malignant fungous disease, if there is not confusion in the accounts related of cases of the disease. As I have myself seen it, indeed, it appears to be a peculiar local disease of the absorbent glands (and I have therefore placed it in this genus of tumours), confined generally to the glands, though, as we have seen, accompanied sometimes by small cutaneous tumours where no glands are known to exist. I have already observed, however, that Dr. Carswell does not distinguish it from cerebriform disease, and Mr. Abernethy describes a case in which a tumour supposed by him to be of

this nature in the axilla was succeeded by tubercles in the lungs, heart, liver, omentum, and other parts. Now if this be so, we must evidently regard it as only a modification of cerebriform fungous disease, in which the whole body is less affected than is usually the case with a fungous tumour of that or any other sort.

In the treatment, however, of the disease there is sufficient to demonstrate at the least a very considerable modification of malignant disease, since it is sometimes very much influenced by medicine, which cannot often be said of fungous diseases. As it occurs in lads, and looks like scrofulous enlargement, it will at least be right to try some remedies, before having recourse to operation. I have told you that in the lad of whom the cast is before you, the tumours in the neck had become lessened to half the former size, and the separate cutaneous tubercles disappeared; when I saw him some months afterwards, however, the disease was again increasing, and his health a good deal affected, and I dare say the disease proved ultimately fatal. Now in this lad what seemed to do most good (when a great variety of means were tried), was the occasional employment of a few leeches, with cold lotions, whenever the tumour was attacked by the temporary inflammation I have alluded to (at which time, besides the pain in the tumour, he suffered much from pain in the head, as if the circulation in the brain was interfered with by the pressure of the tumour on the jugular veins), while he took internally, during a long time, small doses of blue pill with sarsaparilla. Mercury, however, must not be given so as to affect the gums, for I have observed, that whenever the action of the medicine was greater than that of an alterative, the disease became worse, and I have been obliged to intermit its use. Some good was done at this time in this lad by liquor potassæ, of which he took as much as ʒij. three times a day. Some good is occasionally done by iodine, but not so much, I think, as by the other means, and sometimes iodine does harm, probably when there is a disposition to inflammation. This patient had been the servant of a medical man, who informed me that he had employed a tincture with double the usual quantity of iodine, and that he had at least given as much as ʒij. of this strong tincture twice daily, while you know that five drops will be too much for some persons.

It only remains for me to speak of an operation, when your medicines fail, in checking the growth of the disease. Now in general this is useless; the disease is a constitutional malady, and while you remove some of the tubercular masses, others will continue to form. I had a consultation on this lad for instance, but both sides of the neck being immensely large, while tubercles existed elsewhere, it was considered out of the question. Where, however, the diseased mass is more local, and is troublesome, and the patient is desirous of an operation, it may be performed, though not always completely. In this preparation you may see a great number of the tumours

which I assisted Sir Benjamin Brodie in removing from the upper part of the neck of a boy in this hospital ; many were drawn out from their cellular beds, exposing the carotid artery and jugular vein ; but even then, many small glands or tubercles were obliged to be left. In this case, however, I understand the tumours had not returned for a year or two after the operation ; but in many other cases the removal of all the glands and tubercles, then enlarged, has not prevented the subsequent formation of many others, and the death of the patient from ulceration or irritation.

III.—6. The next genus of sarcomatous tumours may be called *Serofulous Tumours*. Serofulous or cheesy matter is a secretion from the vessels of the body in a particular state of constitution, and may be deposited in various situations, and in several ways. You meet with it in the internal viscera, in the form of tubercles, cyst-like in appearance—as in this preparation of the liver—the serofulous matter being a mere deposit from the cyst, which Dr. Carswell has demonstrated to be frequently at least an enlarged biliary duct in that organ, or an air-vesicle in the lungs ; you find it, also, in the cellular structure below the skin, or in the cancelli of the bones, or in the absorbent glands, with or without swelling of the affected part ; and, thirdly, but more rarely, it is deposited more universally in the structure of any part, so as to constitute not merely an inflamed swelling with some serofulous matter, but a distinct chronic tumour, consisting in part of the unorganized matter in the cellular tissue of any organ, which tumour is sometimes of considerable size.

It is only in the latter form that it can be called a tumour ; and you may here see such masses in the thyroid gland, the brain (where it causes epilepsy and compression), and in the testis and breast ; and it occurs in other parts also. The serofulous tumour in any organ is a soft, elastic, globular, or oval mass, semi-fluid occasionally in feeling, though generally firmer in consistence, resembling a fatty tumour in this respect, but deeper and more globular ; and often not single, but two or three are at once felt in the same part. Such tumours may be of the size of a nut or walnut, or small apple, giving very little pain, and possessing very little tenderness ; nor have they much disposition to suppurate, unless the serofulous tendency be very strong, so that years may elapse without any abscess being formed.

Serofulous tumours are very much under the control of medicine, as you might expect, so that I have seen very large ones disperse when in the breast, or thyroid gland, or when the absorbent glands have been thus enlarged so as to form a large solid mass in the neck or axilla. The most useful remedies are, alterative purgatives, such as the hydr. e. eretâ, and rhubarb, with alkaline medicine, especially the liquor potassæ in large doses, continued for a considerable time. With potash you may combine bitter medicines, or sarsaparilla sometimes ; or the potash may be given at the

same time with small doses of the tincture of iodine, or hydriodate of potassa. I shall not dwell, however, upon the medicinal treatment at present, as I have recently spoken to you of the cure of scrofula in whatever way it may be developed in the body. Locally, I think a mercurial or ammoniacum plaster alone will be of most service, or a stimulant lotion of salt solution, or the hydriodate of potassa ointment, or the strong solution of iodine in a solution of the hydriodate, applied daily with a camel's-hair pencil. Constitutional remedies have more influence, however, if judiciously employed, than any local application.

III.—7. We next proceed to the *Cystic Tumour*, which is composed of a vast number of cysts, united by more or less cellular substance, and varying in size from that of a pin's head to a pea or marble, or in the ovary to a greater size still. The cysts are vascular, and separate from one another, as you may see in these preparations, and secrete various fluids; generally thin and transparent mucilaginous water, like the fluids of the serous encysted tumours; sometimes opaque and dark brown, or green, or almost black; occasionally, a few cells of cheesy matter are mixed with the rest, and sometimes the contents are semi-purulent.

In speaking of this tumour in the breast, Sir Astley Cooper calls it the cellulous hydatid disease; but, as you see, the cysts are not hydatids, but are vascular, and highly organized; and if a few hydatids are found in some of the cysts, this is merely a coincident circumstance, just as you occasionally find these animals in fungus hæmatodes and other tumours.

Sir Astley attributes the formation of the tumours to the obstruction of ducts; this will account for their formation in the breast or testis where the tumour is sometimes met with, or in the kidney, as in this preparation and plate, where a vast number of watery cysts are seen with hardly any of the natural structure remaining. But it will not explain the growth of the tumour in the ovary, where it is most frequent, and the cysts are, in this situation, a great deal too numerous to be easily attributed to enlargement of the Graafian vesicles. But here you will see a tumour of apparently this texture in the situation of a fractured and ununited rib: and Dr. McFarlane has met with such a tumour between the peritoneum and the abdominal muscles. Just, then, as we have already seen with regard to a single serous or aqueous encysted tumour, so with this cystic tumour also, if, as is no doubt the case, cysts of fluid arise from obstruction of the ducts of secreting organs, yet, if it is formed in simple cellular structure, where no ducts exist, we must at least look to more than one cause for its origin; and in the ovary, where the cellular structure is so tough, enlargement of these cells will scarcely arise very easily. But, after all, I cannot explain to you why in a certain individual all the ducts of the breast or testis, or all the cells of the cellular membrane in a given part of the

body, and in that only, should be obstructed and enlarged, and secrete peculiar materials.

Examine the cystic tumour and you will find it soft, elastic, with obscure fluctuation, the fluid not being so evident as in simple cysts, from the numerous partitions of the tumours. It is not very heavy when poised in the hand, as a completely solid tumour of fungous disease would be. It is of slow growth, several years elapsing before it often attains a large size ; and it has little disposition to inflame, or to adhere to the skin, or to ulcerate. It sometimes, however, has one cell after another in a state of suppuration, and bursting, as a small abscess, without the inflammation spreading to the mass of the tumour. This is a part of the cystic tumour which grew in the breast, and must have weighed several pounds ; and yet it presents no mark of much diseased action. Sometimes enlarged veins are seen on the surface, as in malignant disease ; but this may be observed in any tumour, in which the passage of the blood through it is retarded, without being necessarily a sign of malignant action. In the ovary the tumour grows to an enormous size. I have seen one of seventy pounds weight, which was tapped in three places, and the fluid of as many of the largest cysts evacuated, which immediately became as solid as jelly or glue.

Cruveilhier, in speaking of this tumour, I believe, in the ovary, calls it the same disease as what has been termed *cancer aréolaire* or *gelatiniforme*, which disease I show you here in the stomach : even he, however, calls the cystic tumour, a local disease, only affecting the neighbouring textures by continuity. For my own part, however, I have never seen any evidence of even the largest (not even the one I have just mentioned of seventy pounds weight,) which seemed to affect any part besides the organ attacked ; and I am not inclined to attribute any malignant action at all to this disease, not even the power of contaminating the parts around ; believing that it is not the same affection as the gelatiniform cancer.

Whenever, then, a part of the body is affected with this tumour, and is becoming inconvenient from its size and weight, you may remove it, I believe, if accessible, with perfect safety, and without fear of an unsuccessful result from any constitutional taint. I say little of any thing but removal, since local remedies have little influence, even upon the fluid part, and none whatever, I believe, upon the solid portion of it. You may try, however, some of the stimulant lotions I recommended for the single cysts, the muriate of ammonia, or the camphor spirit and goulard, and so on, or iodine applications. You may also try internal remedies for a time, at least early in the disease, such as potassa and iodine.

III.—8. The next genus of sarcomatous tumours on our list is more rare than the last, and I have been accustomed to call it, for distinction, the *tuberculous cystic tumour* ; and I scarcely know whether it should be placed

by itself as a separate genus, or only considered as a species of the last. It consists, as you perceive, of a large cyst, which generally contains a yellowish or brownish fluid, into the interior of which cyst there project a number of bodies, like a bunch of grapes sometimes, of various sizes and shapes. These tubera look like portions of the cystic tumour, and are soft, of a white or yellow colour, and a section of them shows that they are also cells with a similar fluid or semi-fluid jelly enclosed in a membrane similar to that of the large cyst which surrounds the whole. In these preparations from the breast there seems little difference, except in the form and connections of these portions, from the cystic disease, and both are not very unfrequently met with in that organ. In the ovary, the tuberculous cystic tumour is not uncommon, of which this is a good example. Here is also a beautiful drawing, from Dr. Seymour's excellent work on the Ovaria (to which I may refer you for a detail both of this and of the cystic tumour, as they present themselves in that organ), which shows you the recent appearance of the same tumour, in a case which I have cause to remember, as it cost me three months' illness from a wound, after the death of the lady. There was a large quantity of fluid, which I drew off several times by tapping, and the section of the tuberculous masses bears some resemblance to the areolar cancer of the mucous membranes. The tumour was remarkable before it contained much fluid, from the contradictory opinions given with regard to it by different medical men, whether it was the ovary, or spleen, or liver, or some new structure altogether.

In speaking of this disease in the breast, Sir A. Cooper calls it a form of hydatid disease, and expresses his opinion that hydatids, having been subjected to pressure, have been killed, and subsequently become attached to the cyst around, into which they hang like polypi; there is not, however, the smallest evidence of the hydatid origin of the disease, nor, indeed, of hydatids in any part ever becoming attached when deprived of their independent vitality.

I cannot, then, explain the peculiarity of the appearance of this tumour; but I may add, that it would appear as if such pendulous bodies as are here met with did really become sometimes strangulated, as it were, so that they are bloody and soft, as if mortified, with coagulum in their substance.

The appearance of the tuberculous cystic tumour in the living body is that of a generally smooth surface, but sometimes, of more irregular figure than the cystic tumour: it has a sensation of more distinct fluctuation, but this will depend on the relative quantity of fluid; and when it is pressed deeply, it is generally easy to feel the mixture of solid matter presented by the projecting tubera. The skin is dark-coloured and purple, over a large space sometimes, and is more frequently attached to this than to the cystic tumour, and the enlarged and tortuous veins on the surface are more evident. In the

several particulars I have just mentioned, the tumour bears much resemblance to one of fungus hæmatodes, nor do I know any positive distinction between the two before removal, in all cases. Here is one which Mr. Babington removed from the breast, which was extremely dark-coloured, but from the perfect health of the patient, with some trifling circumstances in the part, I believe we all formed a correct diagnosis before the operation, which was confirmed by the dissection and by the result; at least there was no evidence of any return three years afterwards. In the ovary you can often distinguish the tuberos cystic tumour from the aqueous encysted tumour, and from the cystic tumours, by the irregular solid masses which you can feel through the parietes in a thin person, and which sometimes have hardly afforded me room to tap the patient. In the lady from whom this was taken, by the time of the fifth operation, hardly any space was left, as the tubera increased in size and number between the intervals of the tappings.

There is no cure, I believe, for this disease; the quantity of fluid may be made to vary, but the whole tumour should, if possible, be removed, and the operation, as for the cystic tumour, may be undertaken with a fair prospect of success: at least I have not seen any more evidence of malignancy than in cases of the cystic tumour. I have mentioned, in this case from the breast, that the patient was quite well three years after removal: in the case from which this larger tumour, with more solid matter, was removed by Sir Benjamin Brodie, from the same part, a longer time, I believe, elapsed; and Sir Benjamin informs me (and Sir Astley Cooper says the same, in his work on the Breast), that the tumour has not returned, nor affected the system, in several cases where these gentlemen have operated on large tumours of this kind. It is true, indeed, that in the ovary, where it grows to so great a bulk, the patient suffers great irritation, and becomes emaciated, and dies worn out by her disease much earlier than is usual with other forms of ovarian cysts, and with a countenance sallow and sunk, as if with malignant disease; and it is thought by some for whose opinion I have a high regard that it is a malignant form of structure. But though I have seen cases of malignant disease, with cysts too, in the ovary, yet, even when the patient has died of the tuberos cystic tumour, with what has been regarded as the appearance of the system being impregnated with the poison of malignant disease, I have not seen it evinced in any tumour of the glands communicating with the ovary, nor in other parts of the body; and sometimes, when it is of great size even in this internal situation, the irritation is much less than usual. I tapped a woman, for instance, about fifteen times in nearly three years, taking away as much as 74 pints of fluid at a time, and yet, but for an accidental attack of erysipelas and inflammation of the sac, which had numerous tubera within the cyst, the patient appeared likely to have lived some time longer.

I have now mentioned to you a great number of tumours, of which one or more cysts form the whole, or a part :—serous cysts, serous cysts, congenital cysts, hydatid cysts ; 2ndly, osteo-sarcomatous tumours ; and 3rdly (of the sarcomatous tumours), the cystic and tuberculous cystic ;—in all of which we have found that the disease is innocent, or rather not malignant. But further, cysts are often found connected with malignant disease, either in the same situation, or in some other part of the body ; and tumours with such a combination especially resemble the two last genera of tumours. Here is a testis which I removed by operation, with a great number of cysts in its substance, and in many respects like a cystic tumour, but it is, on the contrary, a malignant tumour, and returned in the glands in the abdomen. Here, again, is a tumour like a case of tuberculous cystic tumour, which I punctured in the neck, and dissected out after death ; but which also followed fungus hæmatodes of the testis, like the other specimen, and was accompanied moreover by a large fungous tumour in the abdomen.

In the living body I do not think you can always distinguish one case from the other, where there are no constitutional symptoms to guide you, and no tumours elsewhere to indicate the malignancy of the disease. This is of less consequence, however, since wherever a tumour contains *many* cysts, or even a single cyst is joined to much *solid matter*, you must remove it, whether it be malignant or not ; and having examined it after the operation, you can form, at least, a probable opinion of its nature, and give your prognosis accordingly to the patient and his friends. If, for instance, a tumour contains a number of cysts, the contents of which are the ordinary secretions of such cysts—watery, gelatinous, cheesy, and so on ; and what solid matter there is in the substance of the cysts, and in the cellular membrane between them, appears to be the ordinary deposits of inflammation, you may assure your patient, with tolerable confidence, that he is safe from any return of disease ; if, on the other hand, the secretions and the solid deposits have any signs of the various malignant deposits, cerebriiform, melanotic, and so on—even if the solid materials bear a very small proportion to the cysts, yet you may feel assured of the malignant nature of the tumour ; the existence of the cysts, in such a case, is an accidental circumstance only, that does not lessen the chance of the tumour returning. But further, when the solid matter bears a large proportion to the cysts, even if you cannot quite satisfy yourselves of the exact nature of such deposits, yet you should, I think, always regard the combination with suspicion. And lastly, if a tumour containing cysts is growing rapidly, and is accompanied with severe constitutional disturbance, such as irritative fever, you will learn to anticipate the malignant nature of the tumour : for instance, a woman came under my care, with a tumour of only nine weeks' duration, in one mamma, but which was already two feet in circumference. I punctured several large cysts, with

great relief to her sufferings, and felt the solid matter between them ; but the tumour, growing thus rapidly, had caused so much fever, that, on consultation, its removal was not considered advisable. The circumstances I have mentioned led us to believe the tumour malignant ; and when she died with fever and extensive gangrene of the tumour, three weeks afterwards, its solid substance was distinctly cerebriiform and hæmatoid, mixed with the large cysts, and the same disease was just commencing in the axillary glands.

The numerous circumstances in which cysts are connected with morbid growths, have led to the formation of numerous theories with regard to them. One of these theories is, that all tumours whatever owe their existence to the previous formation of cysts ; and some theorists, going still further, affirm that these cysts are hydatids. Mr. Carmichael, for instance, proposes the cure of cancer by the use of carbonate of iron, to kill the hydatids of the disease, as that substance destroys the intestinal worms. I need say no more, however, upon this subject.

One of the most ingenious theories in connection with tumours is afforded by Dr. Hodgkin, in the 15th volume of the Medico-Chirurgical Transactions. This gentleman, like the pathologists I have alluded to, attributes the structure of all tumours, even of solid scirrhus tumours, to the previous formation of cysts. This diagram, and the tuberos cystic tumours, will explain his theory to you. It is, that a cyst having been formed, a second is formed thus between the layers of the cyst, and projects into its interior ; then a third between the layers of the second, and so on *ad infinitum*, so as to constitute a large mass. Now this theory would undoubtedly seem to be true as to this particular form of tumour (the tuberos cystic), to a certain degree ; but he goes on to explain the solid structure of hard tumours in the same way. There is in them no fluid ; but the secondary and tertiary cysts having been developed, are, according to the theory, pressed together and joined, so that, on a section, the white lines and bands of solid substance then exhibited, especially in cancer, are the successively formed cysts, pressed together, which in this manner constitute the tumour. Now this theory does not appear to me to be at all well-founded, as far as I have tried to unravel the tumours in question ; nor is Dr. Hodgkin's opinion adopted, I believe, by any pathologist who has examined the subject.

LECTURE V.

III.—SARCOMATOUS TUMOURS (*continued*).

On the Nature and Properties of Malignant Diseases.—9. Verrucous Tumours of Cicatrices.—
 10. Carcinomatous Tumours.—Definition ; Various forms of Carcinoma.—Period of Life ;
 Hereditary ? Exciting Causes.—History of a Cancerous Tumour ; Treatment, General
 and Local ; Operation for.

WE have now discussed eight different genera of the third order of the class of tumours ; namely the adipose, fibrous, neuromatous, conglomerate, conglobate, scrofulous, cystic, and tuberos cystic tumours, and we have found that they are all innocent, *i.e.*, non-malignant ; not possessed of any contaminating influence, even of the lowest kind, so that they are all local diseases in this respect ; unless it be that the conglobate and the tuberculated conglobate tumours are malignant ; but I am rather inclined to call even those tumours incurable affections of the absorbent glands, than really malignant diseases. I do not think there is sufficient evidence that either of these tumours, nor the cystic, nor tuberos cystic tumours, possess the power of causing the same structure as their own to be formed by their influence in the surrounding tissues, nor in the absorbent glands, nor in the whole system. But, at the same time, we have found that they are not innocent in their effects on the patient ; on the contrary, they may be fatal to life itself, by irritation, by ulceration, sloughing, and bleeding, unless they are removed by operation, which may be done with safety with all of these tumours, except sometimes the tubercular conglobate tumour, if the operation is done early, and the tumour is accessible to the knife.

But you must not forget that all tumours may become malignant, although they are not so originally ; and perhaps they are in themselves a source of malignancy ; that is to say, if the constitution of an individual is disposed to malignant action, and if he happen to have a tumour in any part of his body, that part will be selected for the development of the constitutional taint ; just as, if a patient deranges his system so as to dispose it to form ulceration somewhere, the new structure of a cicatrix will be the first, in all probability, to give way. Thus a mole, or a fatty tumour, may become malignant, and go through all the changes of a malignant tumour ; a man was admitted into the hospital, for instance, under Mr. Babington's care, with a fungous tumour of the size of the fist, which, for forty years, had been a small mole unchanged in size and nature. A new action is suddenly developed, and a new character is assumed by the part, and it now gains the property of contaminating the structures around, and making them like themselves in appearance, and of contaminating also the glands, and of poisoning the whole body. I need hardly say, then, that this observation is a sufficient reason for your taking away even innocent tumours, if the patient can be induced to submit to their removal, lest they should become a cause for the

development of malignant action, which the patient might have escaped if no morbid structure existed.

I have used the expression malignant condition of the whole system ; now what are you to understand by this? You will recollect what was formerly told you as to the different degrees in which malignant action is exhibited ; first, it may be apparently entirely local, so that forty years may leave a patient with only one part affected. Secondly, the glands to which the absorbents come from a malignant tumour may be enlarged in consequence of their connection with that tumour, and yet the general health may still remain pretty good ; but, thirdly, the health may give way nearly simultaneously with, or even before there is any evidence of local disease at all, showing, in the latter case, that the constitution must have been tainted before the formation of the tumour. But now comes the important question, whether any malignant disease whatever is really local, or whether the constitution is always affected first, as it unquestionably is sometimes ?

It was said, I believe, first by Mr. Wardrop, with regard to fungous hæmatodes, and the opinion is elaborately supported by that zealous pathologist, Dr. Carswell, as to all malignant tumours, that the actual matter of the disease circulates in the blood, and the arguments in favour of the opinion are threefold :—first because the new substance is deposited by the capillary vessels, nutrition and interstitial absorption going on together, so that the malignant matter simply occupies the place, and assumes the form of the original materials of the body ; an argument that goes for very little, as it would equally apply to cartilage or urine, though nobody goes further with regard to such substances than to affirm that their elements are contained in the blood, and separated by the capillaries in a new form from that fluid.

Secondly, because the matter of malignant disease is found in the blood-vessels ; you will see in these preparations the trunk of the *vena portæ*, and all its branches in the liver, completely filled with solid substance, so that the circulation must wholly have been interrupted through the vessels. But this also is no proof that the blood has contained the peculiar substance in that shape. (*a.*) In the vessels, as well as elsewhere, the malignant structure is deposited, in all probability, by the capillary branches of those vessels, as in ordinary nutrition, and it is therefore generally organized and adherent to the sides of the vessels, by means of organized communication. (*b.*) It gets into the vessels by ulceration through their coats, and then spreads rapidly, from its being subjected to less pressure ; you may see here a little portion of tumour just ulcerating into, and hanging loose in the *vena cava superior* ; another portion is ulcerating through the pericardium, and the gentleman from whom I took the preparation, who was a patient of Dr. Seymour's, died suddenly while at the close-stool, by hæmorrhage into the pericardium. (*c.*) Sometimes, again, malignant matter gets into the vessels by absorption ;

I have seen it, in the absorbent vessels, coming from a tumour, in its passage to the glands, and I believe it is found in the same way in the small veins; but this is *after* it has been secreted by the capillaries, just as pus is found in the same vessels, and thus you have one mode of contamination of the system.

Thirdly, the only probable proof that the malignant matter exists in the first instance in the blood, without having been previously formed, like every other part, by the vital action of the capillary vessels, is the circumstance of an effusion being observed in a soft condition, in some places consisting of a mixture of blood and malignant matter. But I have not seen this satisfactorily made out. I have often, indeed, seen a mixture of fluid malignant matter mixed with blood, but only when it appeared likely to have been formed previously to the rupture, either in the cellular substance or on the surface of the membrane,—in the same way as you may often see a mixture of purulent matter and blood, without adopting the supposition that the pus had been mixed with the blood, so closely combined as to be dropped from one another, as it were. The pus and the malignant materials are, surely, alike formed out of the elements of the blood, by the capillaries in some part of the body, before these respective substances become mixed, as such, with the blood in the circulation.

See, now, what an important question this is in practice: if the whole system be so poisoned, as actually to contain perfect malignant matter in the circulation, before it is deposited anywhere, either in the molecular structure, or as a secretion, there can be no such thing as a local malignant disease; no operation can consequently be performed before the whole system is tainted; the blood always circulates the poison. I trust, however, that there often is a predisposition only, or tendency, to malignant disease, just as there often is to scrofulous action, before any scrofulous matter is formed; I trust, therefore, that a tumour composed of malignant substance may sometimes be local, aye, and for several years, during which time the blood does not contain any formed malignant matter; but, at last, if a further influence is exerted on the system, or if the matter already deposited is absorbed and mixed with the blood, so as deteriorate that fluid, the patient has now passed the boundary within which an operation affords any security against a return of the malady. Sometimes, on the other hand, there is not only a slight predisposition, but the blood has so strong a tendency to separate those elements, which, when united, constitute malignant structure, that the whole system may be said to be in a malignant condition, before the vessels have yet formed any local tumour; or, if a tumour has been formed, although no malignant matter has yet been absorbed, so as to be mixed with the blood, yet an operation is useless, or worse than useless, and may hasten the formation of the same structure elsewhere in the body.

Now there are several forms of malignant disease which are, for a greater

or less period of time, merely local, especially in the skin ; one such form I shall hereafter speak of, with the other diseases of the face. There is also another, which is so peculiar in several respects, that I shall speak of it, a little out of its place perhaps, as another genus of sarcomatous tumours, under the name of

III.—9. *The Verrucous Tumour of Cicatrices.*

I think it deserves separate consideration, because it has not been well described in surgical works, a circumstance which induced me to publish a series of cases which I had seen of the disease in the 19th vol. of the *Medico-Chirurgical Transactions*, to which I may refer you for a more minute account of it than our time will at present allow. [See *ante*, vol. i., pp. 149-158.]

It belongs to those cases which are called, sometimes, semi-malignant ; but, for my own part, as I think it is essentially carcinomatous in its nature, I prefer the term locally malignant, by which I mean that it is a kind of cancer which contaminates only the neighbouring textures, and does not affect the glands ; at least, I have not yet seen it do so. I have never seen it, except in the cicatrices of old injuries, and I think it probable, therefore, that the peculiar texture of the new skin may influence its growth, making it occur where the constitutional tendency is less than would be sufficient to develop malignant disease in sound parts, and causing it also, when formed, to differ from the malignant tumours of original and sound skin. The injured parts may remain quite well for many years, or may frequently thicken with common inflammation, or ulcerate from the usual causes, and with the common appearances, before the peculiar changes in question evince themselves.

The warty tumour of cicatrices presents three successive stages to your notice :—1. Here is a tumour which formed in the scar left by a flogging, and was removed by Sir Benjamin Brodie from a man who had been sentenced, eleven years before, to receive 1,000 lashes. It was vascular, warty in appearance on the surface, scarcely ulcerated, but discharging an offensive watery secretion ; in this particular case there was very little pain, but the pain is sometimes considerable. You may see, also, little elevations of the same character around the larger portion of the tumour. The section of any portion of the tumour in this condition shows you a firm hard structure, of a dense white colour, rising in a fibrous manner, perpendicularly, from the substance of the cutis.

In the second stage, the tumour becomes less warty in appearance, and is composed of a mass of rounded fungous elevations, still very solid, but less fibrous, when cut into, than before. You may see it in this preparation, which was removed from a man's back by Mr. Jeffreys, and which also

followed a flogging received 27 years previously. Or you can see the nature of the disease still better, in this plate and preparation, from a young woman of 28 years of age, who was under my care. This is the earliest age at which I have seen it, and it followed a burn received when she was a child, which had healed, and left a scar from the toes to the knee. It had broken out into an ulcer, six months before her admission into the hospital, which had generated a luxuriant mass of fungous warts, accompanied with the most intolerable pain, and a very offensive discharge, under which her health seemed rapidly sinking. She refused the amputation which I had proposed to her; but one day, on coming to the hospital, I found, from the house-surgeon, that she had told him if I would perform the operation directly, she would submit to it, but that she would not have it done on any future occasion. You see a large mass of fungous growth, two inches in thickness and nine in diameter, and the section still shows, in some parts, very well the fibrous warty nature of the disease; you may also perceive that although of this large size, and attached to the periosteum, the morbid growth had produced no alteration, except a little inflammation in the bone below. This woman remained quite well two years afterwards, and had no return of disease in a part of the cicatrix, which I had left, in order to amputate the limb below the knee.

In the third stage, the fungous growth ulcerates, and leaves a foul ulcer on the level of the skin, and spreads by the edge around, when the skin goes on forming warty elevations of the same character. Here is a very beautiful preparation of the disease in this state, which I took from a man whose limb was removed by Mr. Gunning, when I was house-surgeon, and in whom it formed in consequence of a gun-shot wound. A patient was under my care for a very extensive ulcer in the back, following a burn, which had been healed eleven years; it was too late for operation, being ten or twelve inches in diameter, and the man fell a victim to the intolerable pain it produced. Even then, however, it had not extended below the fascia, and there was no sign of morbid structure in any part of the body.

I have seen various methods tried to destroy the morbid growth, many of them on the supposition of the disease being only an unhealthy ulcer, but without avail. Looking upon it as a malignant disease, it is evident that we ought not to expect any measure to succeed which does not insure the entire destruction of the new growth, which can, of course, only be effected by strong caustics, or by the knife. Of the caustics, the best is the chloride of zinc, but I much prefer the excision of the tumour, if that is practicable, by the knife, or the amputation of the limb, when the disease is too extensive for excision. The patient remains, I believe, free from a return of the disease, as he ought to do if the disease is only locally malignant, and as he has done, as far as I know, where I have seen the removal of the disease practised.

Separating, then, for convenience sake, the verrucous tumour of cicatrices from cancer, of which it is probably only a variety, the two remaining genera of tumours are malignant in the highest degree, affecting not only the surrounding textures, but the absorbent glands also, and poisoning the whole system; and most of the remarks I have to make upon them, apply equally to the disease, whether there be, strictly speaking, a tumour, or whether the new structure be only an interstitial deposit, as in the cancelli of the bones, or the textures of the internal organs, without increase of their bulk.

III.—10. *Carcinomatous, or Cancerous Tumours.*

Surgical writers have often divided this disease into two stages:—1st, Scirrhus; 2nd, Cancer; terms which are synonymous with the expressions occult and open (or ulcerated) cancer. Scirrhus is a bad name, however, to retain, since it is used by the older authors to designate any hardness which is the result of inflammation or disease. I should rather say the older English authors, for it is still very often used by foreign writers, without any definite idea of the disease as an affection of the system; some of the French, for instance, often speak of scirrhus and cancer from syphilis, a sequel of the latter disease purely imaginary. Unfortunately, these efforts of the imagination are not confined to the mind, but are carried into surgical practice, and nothing is more common than to hear of a great number of operations for cancer of the rectum, in which that gut (sphincter and all), has been cut out for simple ulceration, or of a great number of cases of excision of the cervix uteri, in young women of eighteen, for supposed cancer of that part. Some, indeed, instead of dying of cancer, have survived the operation, and have borne children afterwards, grateful, doubtless, to their operative friends for the preservation of their lives! such cases, no doubt, having been instances of hardening and enlargement of the os uteri from simple inflammation, for which some persons might prescribe caustic, and some matrimony; and either remedy, I dare say, would be pleasanter than excision, and quite as efficacious.

By *carcinoma* (*scirrhus*), then, I mean the generic name applicable to all forms and stages of the disease, whether there be a distinct tumour or not, and whether the part be recently formed, or extensively ulcerated. Almost every structure in the body is liable to carcinoma, but some textures are more disposed than others to the disease; it is very common in glandular organs, such as the breast and liver, which you may here see; and, where mucous follicles abound, as in these preparations of the cervix uteri, the cardia of the stomach, the œsophagus, the colon, the rectum: you may see it here in the lungs; here in the skin, and at the junction of the mucous membranes with the skin, as in the penis and labia; in this preparation you perceive it in the serous membrane, the pleura; and in this in the bones.

And, in whatever tissue it originates, the morbid structure affects, by degrees, all the contiguous textures : you see in this plate, for instance, and in this preparation, that it implicates distinctly all the coats of the stomach, after having begun, as it would appear, in the mucous membrane.

Cancerous structure affects several different forms, and varies much in its appearance. (a.) The most usual form of an external tumour is that of a tolerably circumscribed tumour, which is generally firm and hard in texture, something like cartilage, sounding under the knife when cut : running through this you can distinguish a number of bands, or rays, of a white or brownish white colour, from which the disease derives its name of cancer ; these bands extend to the neighbouring structures, however, from the tumour, and are the result of carcinomatous deposit in the cellular tissue, which is much disposed to the disease, so that you will occasionally see the skin connected to the tumour by these cancerous bands while the intermediate fat remains healthy. It seldom, therefore, happens that a tumour is really as circumscribed as it appears to be : it is not confined by a cyst, but these bands are sufficient to propagate the disease after the tumour itself has been removed. In the interstices of these membranous bands a cancerous tumour is less compact, and you can squeeze out a milky fluid, or a transparent liquid like glue. (b.) At another time the tumour is less solid and has few bands, and resembles what was called, by Mr. Abernethy, the udder-like or mammary tumour. (c.) Sometimes the tumour has a number of cysts within it of small size, and containing mucous, or a bloody fluid, or a liquid like chocolate in appearance, and in a large cell fungous excrecences of cancerous structure are sometimes found. (d.) In another instance, especially in the hollow viscera, as in these instances, it is soft and transparent, constituting gelatiniform cancer, or *cancer aréolaire*, as it is called by Cruveilhier, or the *matière colloïde*, of Laennec. (e.) In other cases, the cellular bands are almost entirely wanting, and there is a larger quantity of unorganized greasy secretion in the interstices of the cellular membrane, making the lardaceous tumour, such as you here see in the lung and liver. (f.) In other cases, any of these structures will affect a distinct tubercular form, with a surrounding cyst more completely insulating the diseased substance than usual, as here in the liver or lung, or in the form of a number of little tubercles around the original tumour, without any apparent connection with it. (g.) Or, lastly, you will find millions of little hard rounded or flattened tubercles in the serous membranes, especially the pleura, as in this instance, projecting into the serous cavity. But there is no essential distinction in the disease from these variations of character, and you will meet with all these forms of structure in the same person in different organs or tissues, and several of them at once, in separate parts of even the same tumour.

A characteristic distinction of cancer from other malignant tumours, is, that it is a disease of the middle period of life, from about 35 to 55; it is very seldom met with under 30 years of age: I have only once seen it in a young woman under that period; but no rule is without exception, and Sir Everard Home met with an instance of a girl who, when 15 years old, received a blow on the breast, which left a hardness in the injured part, and at 20 this lump began to enlarge, with the usual signs of cancer, and was subsequently removed by operation. So also cancer sometimes shows itself after 60 or 70 years of age, but seldom, except in the skin, at such an advanced age.

Cancer appears much more frequently in females than in men; it is said, in the proportion of ten to one; and in females (in whom it takes place chiefly in the uterus and mamma), the disease occurs very often about the time that menstruation begins to cease, and when these organs are no longer useful. It is said, too, by many persons, that cancer of these parts occurs more frequently in unmarried females than in those who have borne children; as if these organs, when their natural functions are not called into action, are like children, who cannot remain idle, and are therefore always getting into mischief, if not properly employed. I am, myself, however, very doubtful if this observation be well-founded, or whether even the reverse may not really be the case.

It seems not improbable that cancer is, to a certain extent, hereditary, so that you will often find the parents and children in a family, successively, have the disease, or several sisters will each die, at a certain age, of the disease. Of course, from what I have before said, you are not to understand that cancer is born with them, or that cancerous materials exist in their blood from birth, but only that a certain peculiarity of constitution is hereditary, so that when any exciting cause is applied, cancer is more likely to show itself in them than in persons who have not this peculiarity; just as persons with an hereditary predisposition to scrofula cannot expose themselves to cold with impunity; though no one imagines that scrofulous matter is circulating in the vessels.

The cause of the development of a cancerous tumour is, then, the existence of such a state of system as that just described; but the situation chosen is frequently attributable to some external injury, or other exciting cause. It frequently takes place in the hardness left by inflammation, as by a blow on the breast; it often arises from the local irritation of soot upon the scrotum, or of a tobacco-pipe upon the lip. Sir Everard Home met with this remarkable case: a sailor contrived to get his penis squeezed by a piece of wood, and flattened like a half-crown, an accident which, as you may imagine, made the man faint from pain, and produced inflammation of the penis and testes; he recovered, however, except having a small pimple,

which, six months afterwards, ulcerated in the form of cancer of the penis ; this was followed by a tumour in each groin, which ulcerated also, and in four years he died in this hospital, from frequent bleeding from the ulcerated parts ; and, after death, a number of glands were affected in the lumbar region in the abdomen, and in the mesentery, liver, and other parts. Sir Everard Home went so far as to believe that cancer never was developed unless in a part which had been injured, or diseased in some manner or other, previously, in which case, the morbid alteration of a simple kind, the pimple or wart, or whatever it might be, became afterwards cancerous ; but he was, no doubt, wrong in thus supposing that it did not occur in healthy parts, and you will find cases, not unfrequently, in which, with all their fondness for finding local causes, your patients can assign no reason why any particular locality is attacked.

Cancer, as it is modified by texture and situation, will be more particularly described to you hereafter, with the diseases of the breast, the scrotum, the lip, the eye, and so on, and in your medical lectures ; but let us now trace the progress of a cancerous tumour, in any part of the body, in its common form below the skin.

A cancerous tumour, in its early stage, feels like a firm, hard mass, circumscribed and distinct from the organ in which it is situated, but yet generally giving you the sensation of its being intimately attached to other textures ; sometimes moving freely below the skin, and upon the deeper parts ; but this circumstance also is doubtful even in the early progress of the tumour : the tumour is generally irregular on the surface, with somewhat angular projections, but in many cases where the interstitial fluid is in considerable quantity, so as to make the tumour softer, its exterior feels quite smooth and uniform. It has grown to a certain size without being observed, and without pain, but as it increases further, it is attended with a good deal of pain, which is described as acute, lancinating, stabbing, darting, and so on, expressing its irregularity in degree and kind ; the tumour is not very tender in general, but the pain is much increased afterwards by handling ; sometimes the pain is most at one part, and this occasionally from a nerve stretched over the tumour.

The pain is considerably aggravated as the second or ulcerative stage comes on. The tumour now becomes attached to the skin, which is generally puckered and contracted at the point ; then it becomes red and ulcerates ; or a part of the tumour grows more rapidly than the rest and projects, and becomes of a dark colour ; it gets thin, and gives way by being stretched as it were ; it does not suppurate, but simply ulcerates and wastes away. The discharge is thin and watery, or an imperfect pus mixed with mucus, or it is ichorous, and has a peculiar foetid odour. The ulcer is flat, and the edges thin and superficial, and increases gradually, as represented in this cast ; or

it has sloughs formed upon it of a dark colour, with frequent hæmorrhage, as in this cast, and the edges are sometimes thick, raised, and everted, as is shown in this cast. Sometimes ulceration is established in the interior of the tumour, instead of on its surface, and suppurates imperfectly. I attended a patient, with Mr. Percgrine, in whom a considerable sized cavity was thus formed, with such an extent of hæmorrhage from the inner surface that the cavity was obliged to be freely laid open to control the bleeding; then the disease became quiet and nearly dormant for above a year, but it has since been fatal.

Now commences the third stage perhaps. Hitherto the general health may have been not much affected, but after the ulceration the patient begins to droop, looks thin, emaciated, haggard, with a dulness of eye, and relaxation of muscle, and has a peculiar sallow, or leaden hue in her countenance, which is well depicted in this plate of Alibert's, or in this cast, and which communicates an expression which the experienced eye of the surgeon recognizes as indicative of a malignant condition of the system, perhaps before much complaint is made by the patient herself. If seen there is now no hope of cure from surgical operation, and the unfortunate sufferer is condemned to drag on a miserable existence, sensible, too, of the disgust created in the feelings of her attendants, by the appearance and smell of this horrible complaint. The condition and state of mind in a cancer ward is well depicted by Milton :—

“Despair

Tended the sick, busiest from couch to couch,
And over them triumphant Death his dart
Shook, but delayed to strike, tho' oft invoked.”

The time which elapses before a fatal result varies very much; it is influenced by the texture in which it arises—by the organ in which it is situated; it depends on the kind of carcinomatous formation in each case, and various modifications of the disease will be described to you by-and-bye, which will influence your practice, especially in the breast. For the most part, about three or four years will be occupied from the first discovery of the tumour. The last scene is sometimes very rapid: a woman, for instance came under my care with a tumour, which she discovered a year before, and which was just beginning to ulcerate, and in three months from this time she died with most extensive disease in both breasts, and in the skin and glands, and in the internal viscera: and sometimes your patient will die in a few months from the appearance of a tumour, when there is no evidence of internal disease to hasten the event. On the other hand, cancer sometimes proceeds very slowly: a woman was three weeks under my care for some other affection, suffering so little, that she allowed this time to pass before she even mentioned to me that she had had a cancerous tumour in one

breast, which had been ulcerated eleven years, and had existed twenty ; she had also a tumour of the same kind in the other breast, of four or five years' standing, and had a little cough, that appeared, perhaps, to be connected with disease in the chest.

Cancer runs its course, I think, quicker in young persons than in old ; I knew a lady who had had a tumour forty years, ulcerated several years before she finally died of hydrothorax, at an advanced period of life. It is more rapid, perhaps, in fat and bloated individuals, than in those of less ample dimensions. In short, there are great varieties in different cases of cancer.

I need hardly say, after this account of cancer, that we possess no cure for it ; the removal of the diseased part, before the system has become affected by it, affords us the only chance of safety from the complaint. But even when the operation has been considered improper, or has been ineffectually performed, we can still do much, both locally and constitutionally, to alleviate the patient's sufferings, and to retard its final result.

Unquestionably, whatever debilitates the body, or irritates the mind, accelerates the appearance of the complaint, and hastens its progress. Anxiety of mind, such as that induced by poverty, or the loss of children, or other dear relations, is often the immediate exciting cause ; and it runs its course quicker in persons of irritable constitutions, and occasions much more suffering.

Mr. Pearson, who is a high authority on some medical subjects, recommends a starving diet, and depletion by purging, and so on, to retard the progress of cancer. More modern experience, however, has fully established the reverse, and I advise you to recommend a moderately nourishing diet. Whatever stimulates does harm, such as wine and bark, if any heat or fever are caused by them, but, on the other hand, whatever lowers the tone of the system accelerates the rapidity of the disease. A young woman, 29 years of age, was under my care, as an out-patient of this hospital, with a cancerous tumour of the breast, and enlarged glands of the axilla, and the state of the parts altogether induced me to advise her not to have an operation performed : after some time she changed her residence, so as to make it more convenient to her to attend at another hospital, where she was kept on low diet, and had a great number of leeches applied during six weeks, at the end of which time the pain was intensely increased, and she was emaciated, and apparently dying. I immediately put her again on a more generous diet, and gave her a course of sarsaparilla, and in a short time she had regained her flesh and strength, and nearly lost the pain in the tumour. Subsequently, of course, the tumour ulcerated, and she fell a victim to the disorder, but her life was certainly prolonged considerably, and her condition rendered much more supportable.

The medicine I have just mentioned is, on the whole, the best, I think,

given in considerable quantity—a pint of the comp. decoction, with a dram of the extract daily, if the patient bears it, and continued for several weeks, whenever the health appears to be sinking, before the irritative fever of the last stage comes on. If the countenance is assuming the peculiar aspect I have alluded to, about $\frac{3}{8}$ of a grain of the oxymuriate of mercury, or five grains of Plummer's pill, or $1\frac{1}{2}$ grains of calomel and a grain of opium, is of service with the sarsaparilla. Sometimes other tonics are of more service, such as gentian, or calumba, which may be joined with soda, or potassa and rhubarb, where the appetite is beginning to fail. Sometimes small quantities of carbonate of iron, or the comp. steel pill, will agree, but not so often as the less heating and stimulant tonics. I have seen the malignant state of the system repeatedly disappear, for a time, under this plan; I have even seen the tumour become much smaller, so as to excite delusive hopes in the patient's mind of final recovery.

Such a method of treatment as I have now recommended is of service to the patient under several different circumstances, though it will not cure the disease: it is useful before an operation, enabling the patient to bear it better; it is of service after an operation, by delaying, at least, the recurrence of the disease in some other situation; and when an operation is altogether improper, the case I narrated to you shows what benefit it may confer upon the sufferer, by retarding the progress of the complaint. Almost the only thing you can do besides, is to soothe the patient's sufferings as much as possible by opium and conium, and other narcotics, with a little colocynth, or other purgative, to prevent the constipation and diminution of the secretions, which attends their use when employed singly.

Locally, also, you can do much good. When slightly inflamed and hot, a weak spirituous and gently stimulating lotion, used cold, or tepid under an oiled silk, according to circumstances, will agree much better than poultices and fomentations; warmth generally increasing the pain. Occasionally, a few leeches are of service applied around the tumour, not upon it, especially when the skin is thin and inflamed, otherwise the ulcerative process is hastened by the leech-bites; and you must take care, at the same time, that they are not applied so often, or in such numbers, as to weaken the patient by loss of blood.

In the early stage of the tumour, when not inflamed, a warm plaster spread on leather, and placed over and around the whole tumour, gives frequently great relief; it may be the mercurial, or opium, or soap, or ammoniacum plaster; or, when the pain is severe, a plaster consisting of one-third part of extract of belladonna, with two-thirds of soap plaster. The opium and belladonna are both, however, offensive to some patients, and induce headache; and the latter, in large quantity, will dilate the pupil and cause headache and other symptoms of its narcotic influence. I have seen the

pain, when of three years' duration in a tumour in this stage, kept quietly within moderate bounds, merely by these applications.

Pressure has been recommended as a means of cure, by the late Mr. Young, but I believe it only lessens the tumour by rendering it more solid, when it would otherwise have had fluid within it, and by causing the absorption, not of the morbid structure, but only of the ordinary effects of inflammation.

When the tumour is ulcerated, the factor is subdued and the sore made more healthy by the chlorides of lime or soda in solution, and they check the sloughing process; a charcoal poultice, or the yeast poultice, will do the same. The pain of the sore is much relieved by a poultice of fresh hemlock leaves, if you can procure them, or by a solution of the extract: $\frac{1}{2}$ a drachm to $\frac{1}{2}$ a pint of water, may be used as a lotion, or in a poultice. The woman from whom this cast was taken derived more relief from the following liniment, than from any other application, which you may rub down and spread on lint:—

℞ Liq. Plumbi Subacet, ʒiss; Tr. Opii, ʒiss; Conserva Rosæ Gall. ʒj.
M. fiat Linimentum.

In another case, most relief from pain is given by prussic acid.

℞ Acid Hydrocyanici, ʒss.; Aquæ distill. ʒviij. M. fiat Lotio.

When the sloughing ulcer bleeds much, as it often does, apply one of these applications:—the muriated tincture of iron, Ruspini's styptic, the decoction of tormentilla, or of galls, or the subcarbonate of iron in powder or mixed with honey, so as to spread on lint.

Sometimes, under some plan or other of these kinds, with judicious constitutional treatment, the sore will become more healthy; it does not granulate indeed, but is healthy enough to cicatrise completely though not soundly, a thin shining dark-coloured skin only being formed; or perhaps just as it is completed, ulceration is again established, and goes on to its fatal termination.

The great point, however, with all cancerous complaints, is to get rid of the local disease, whenever this is practicable and desirable. One method, which is often resorted to by quacks, is to destroy the disease by caustics, of which the most common is arsenic. If used to an ulcer, it may be employed in three ways:—as a paste, by mixing up equal parts, or a third of white arsenic and two-thirds of sulphur, which destroys the whole at once; or in a solution on lint, from five to ten grains in an ounce of lime water, the effect of which is more gradual and less painful and severe; or, as recommended by Dupuytren, in powder, with calomel, but this is the least useful of all the forms. Be very much on your guard, however, whenever you use arsenic, and never employ it at all with a large sore; for many a patient has probably been destroyed by it, as it is easily absorbed. A better caustic, from its not being attended with this risk, is the chloride of zinc, mixed with two-

thirds of sulphate of lime in paste, and with a small diseased part, and a superficial ulcer, it may be used with advantage sometimes, but not if the tumour is large or thick. And caustics are always to be considered inferior to the knife, if the patient is willing to have it used, and the situation of the disease renders it easily accessible.

The removal of the cancerous tumour by the knife forms a very important subject for consideration. It is not, indeed, very often that any operation will affect permanent good; the disease, in a large majority of instances, will return again, and often in a very short time after the removal, where circumstances appear at the time not very unfavourable; but still some few persons escape without any return, and their lives are doubtless preserved by the operation. It is right, too, to perform it sometimes in cases in which a complete cure is perfectly hopeless, in order to afford a respite to the patient's fate, and remove a source of local suffering. A man, 75 years of age, had a cancer of the penis; it was removed because his health was good, and the disease very painful, although a gland was enlarged in the groin. A woman was under my care with a large cancerous tumour of the breast, with enlarged glands in the axilla, the tumour being full six inches high, and sloughing, and irritating her so much that she could scarcely have lived three weeks. I removed the tumour, with a great part of the pectoral and intercostal muscles, in which a number of little cancerous tubercles existed, and the woman said she would gladly have gone through the operation for less than a week's freedom from her previous sufferings; she got well in health, and enjoyed life for eight months afterwards, when she finally fell a victim to the disease. Your patient may again, even in an advanced stage, get rid of a loathsome malady, which she exchanges sometimes for one of equal bodily suffering perhaps, but in an internal viscus, the lungs, or the liver, it may be, but removed from sight, and causing therefore less mental agony.

But in other cases the operation may only hasten your patient's death; sometimes it returns with greater activity in the part itself; sometimes the operation affects the constitution so as to hasten the development of disease elsewhere; and sometimes there are dangerous and even fatal results from the operation itself.

The question of an operation depends a good deal on the kind of cancer in each case, or the organ in which it is situated, and some circumstances of this sort will be explained to you, with the separate diseases of the breast and other parts; much however depends also on the state of the parts affected, and the state of system wherever the disease is found, and I will briefly allude to some particulars which are to guide you.

We have seen that the disease is propagated in several ways; let us examine how each of these affects the chance of removing the whole disease:—first, cancer spreads to the neighbouring parts, where these are

even so little affected as to be apparently healthy, yet when cut into, the disease may quickly return in the cicatrix, or the wound never heals entirely. You may see the skin sometimes altered, firmer and thicker when you pinch it up, presenting a number of spots and black specks, from enlarged sebaceous glands, when compared to the skin around : and I have alluded to the curious fact, that the skin may be thus contaminated, while the fat between the skin and the tumour remains healthy. Sometimes you find, perhaps unexpectedly, in the operation, a number of little cancerous tubercles in the muscles and in the fat around, perfectly distinct from the chief tumour, varying in size from a pin's head to a pea ; or you may distinguish them with the finger moving below the skin ; or little flat or roundish tubercles are found and seen, as well as felt, in the skin itself. I have seen such a disposition to this tuberculation that all the marks left by the cupping, scarification, and by leeches, have become cancerous tubercles. Now, whenever the skin is thus diseased, or tubercles exist anywhere around the tumour, you have no chance of removing the whole disease, and the operation will generally do harm by its effect on the system. For the same reason, when the skin is ulcerated, an operation is seldom admissible, but I do not think a state of ulceration so bad as the thickening and tuberculation of the skin.—Secondly, cancer is propagated by the poison being conveyed by the absorbent vessels ; the evidence of which is a hardness in their course, or an enlargement in the next series of absorbent glands—in the neck, the axilla, the groin, the loins, and so on. Now, whenever glands are thus enlarged, the operation becomes either altogether improper, or affords you very little chance of permanent good, even if you can remove, at the same time with the tumour, all the glands that appear diseased. Sometimes, indeed, especially with cancer of the skin, the glands are irritated and swelled, as they might be from any disease not of a malignant nature, and in such case the glands may subside after the removal of the irritating cause. You endeavour to distinguish whether this be the case by the hardness or softness, the inflammatory redness and throbbing pain, or lancinating pain, of the two cases. But, except to remove a cause of great suffering, as in the instance of my own, before described to you, you should seldom operate if the glands are altered in structure by cancer.—Thirdly, the whole system becomes affected, either previous to the appearance of, or by absorption of morbid matter from the local tumour, according to the circumstances of the case. You are to look carefully, therefore, for evidence of this state, in the sallowness, emaciation, dulness, and languor of the patient. Sometimes, cough, hæmoptysis, or hydrothorax, will show you that the lungs or pleura are affected ; sometimes an examination will show you the uterus affected, when there is also an external tumour ; and the whole body must thus be investigated before determining on an operation on any part.

Something depends on the age of your patient. A comparatively young person may encounter more risk than an old one, from the greater number of years that may be gained if the operation be successful ; at least she may do so if the tumour is insulated, and unattached, and not growing rapidly : otherwise, the very fact of cancer appearing in a young person is an argument in favour of the system being probably already poisoned, or at least very strongly predisposed to the disease. In very old persons all operations are formidable, and you will probably accelerate their dissolution by performing one, for the disease is slower in its progress than it is in earlier life. You may be guided by the natural constitution of your patient, whether she is fat and bloated, or has a more healthy constitution ; and much also by the temper of your patient : you should seldom, indeed, press the operation very strongly on a reluctant person, for this very state of mind may cause a fatal result, in a case where a person of a calm cheerful disposition would recover, and have no return.

LECTURE VI.

III.—SARCOMATOUS TUMOURS (*concluded*).

II.—Fungous Tumours : *a.* Fungus Hæmatodes ; *b.* Encephaloid or Medullary Tumour ;
c. Melanosis.

II.—*Fungous Tumours.*

The last genus into which I have divided the solid tumours, is, like the carcinomatous, of a malignant character ; and it may be divided into three species, viz. : (*a.*) *The Fungus Hæmatodes Tumours* ; (*b.*) *The Medullary Tumours* ; and, (*c.*) *The Melanotic Tumours*. The most striking peculiarities attending these tumours, besides a more rapid increase than the last genus, are, the growth of an irregularly-shaped fungus when the tumour is not subjected to pressure, or when it is exposed by ulceration, and generally a disposition to erosion of the vessels of the tumour, occasioning hæmorrhage sometimes in considerable quantity, from the exposed substance, or into its interior, and we will call it the genus of *Fungous Tumours*.

These tumours have received, however, a variety of different names, derived from their different appearances, sometimes only at different stages of the same structure, which occasion modifications of colour, and various alterations in their course, without materially affecting their essential characteristics. They used formerly, and not very improperly, to be called soft cancer, to distinguish them from the last genus of carcinomatous tumours. Sir Everard Home imagined that the disease was cancer in muscular structure ; but, in reality, cancer is as distinct in the muscles as it is in other textures. They began to be described nearly at the same time, in this country, by Mr. Hey, under the name of Fungus Hæmatodes—by Mr. Abernethy, under that of Medullary Sarcoma—by Mr. Burns the term

Spongoid Inflammation was used (a very bad term, however, since inflammation is not essential to their formation)—by Dr. Baillie the appellation of Pulpy Testicle was used to describe the appearance of fungous tumour in that organ, and Dr. Monro adopted the name of Milk-like Tumour, for another form of the same complaint. Soon afterwards great attention was paid by Laennec, and other French pathologists, to the same form of the disease which Abernethy called Medullary Sarcoma, and they used the corresponding terms, Encephaloid, or Cerebriform Tumour, to describe its appearance. It is singular, however, that while they have much improved our knowledge of the subject, and have discovered another form, the Melanotic Tumour, they should, many of them, have remained ignorant of the real nature of the disease so well described by English authors, and should still class together the vascular nævus and the real fungus hæmatodes. Sir Astley Cooper, again, has used the term fungoid disease for all varieties of the complaint; but as the peculiarity alluded to is not *like* a fungus, but *is actually* a fungous growth, I prefer the name placed in the table behind me, *Fungous Tumours*.

One of the latest and best of our authorities upon the subject of malignant diseases, Dr. Carswell, has placed them all under one head, with the title of Carcinoma, which is sub-divided into heads:—

1. *Scirrhus*, under which name he includes scirrhus, or cancer, in its ordinary form, and in that of a lardaceous, and a gelatiniform mass, and also the pancreatic tumours, or conglomerate tumour, of our division.

2. *Cephaloma*, placing in this division the medullary or encephaloid, and the hæmatoid varieties of fungous diseases, and also the mammary, or mastoid, tumour of Mr. Abernethy, which I mentioned as a variety of cancer (which is not the mammary tumour of Sir A. Cooper, you will recollect), and also what Mr. Abernethy called common vascular sarcoma; but what that is I do not profess to understand.

Now we shall find, presently, that there can be no doubt whatever that cancer and fungous diseases are very much allied. For instance, here is a preparation of cancer of the breast removed by Sir Benjamin Brodie, which was followed by fungous hæmatodes of the rib; but I am not quite pleased with the generic name of carcinoma, as including both these forms of disease, since it is almost universally, in medical and surgical writings, confined to one of them, viz., the true cancer; and it seems very doubtful to me whether some of the diseases included by him, especially the conglomerate tumours, have any title to be placed among the malignant diseases. And then, again, fungus hæmatodes is not like brain, as the term cephaloma implies; and exactly the same reasoning which connects together the carcinomatous and medullary, and hæmatodes tumours, will join to them also melanosis, which Dr. Carswell excludes from the class; because just as cancer

is often joined with a fungous structure, in the same tumour, or they mutually succeed each other in the same part, or in different organs of the same individual, so also does a melanotic tumour join itself to each of the others. All of them are allied, while each possesses some peculiarities, and melanosis is, perhaps, most allied to the fungus hæmatodes in the rapidity of its growth and the extent to which it affects the system.

They may then all, I think, be included in one great division of malignant diseases, of which we noticed the carcinomatous or cancerous variety in the last lecture, and we now have the encephaloid, hæmatoid, and melanoid varieties, to take into our consideration. The origin of all these is often the same exciting cause, and the external characters are so much alike, that we can often not tell what tumour our patient has till it has undergone some farther changes, and sometimes even when removed we cannot, in the present state of our knowledge, decide of what character the tumour is.

Still the division between them is real, in many respects, and it is useful, because our reasoning upon the proper treatment to be adopted, especially with regard to the important subject of operation, very often depends, not upon the general characters in which they all agree, but upon those specific differences, or upon the changes undergone by the tumour at different stages, in which its characters are sometimes, to a certain degree, merged in those of another variety.

The fungous tumours, in their more ordinary form, the encephaloid and hæmatoid varieties, are, on the whole, softer than carcinomatous tumours during all their growth, and often feel quite of a pulpy consistence: a quantity of soft substance may be washed out of them, leaving a flocculent membranous structure pervaded by numerous vessels. In colour they vary much; sometimes there is a soft white matter, exactly like brain; sometimes a yellowish or brownish hue predominates, and there is a mixture of effused blood in some parts, as in this example, in minute specks, or in larger masses; sometimes there are a number of cells filled with different fluids, and mixed with solid fungous matter in the intervals between the cells, and these cells are often half-broken down, or more or less filled with coagulated blood, as in these preparations; which fact is probably explained by supposing that the soft coats of the blood-vessels have been ruptured by unequal pressure. The consistence of fungous tumours varies, however, considerably, from a milky semi-fluid substance, which will not retain its form, when you cut across it, to a solid firm structure, almost like scirrhus: even the hardest, however, want the peculiar radiated and fibrous appearance of cancer, and the peculiar stony hardness, like cartilage, of that kind of morbid structure.

Contrast the two genera in these internal viscera. In the lung there are, in this case, the solid, hard, round, well-defined tubercles of scirrhus; here

are the large, soft, yellowish white (not insulated) masses of cerebriform disease, and here the soft, red, brittle, vascular tubercles of the hæmatoid fungous tumours: the former seated on the surface under the pleura, and projecting into the cavity of that membrane; the latter intimately, and almost inseparably, united with the parenchyma of every part of the organ. Look again at this portion of a liver containing large diffused tubercles of fungous disease, with all the branches of the vena portæ filled with the same substance (as I explained in the last lecture, or as you may see in this plate of Cruveilhier), and compare it with this mass of carcinomatous substance, with the centre harder and depressed, puckered in, as it were, while the rest of the morbid growth expands around—exactly, in fact, as the nipple is drawn in and retracted in cancer of the breast, with prominent enlargement of the substance around it. Such, then, is the kind of structure you will ordinarily find in this genus of tumours in its two species of medullary and hæmatoid materials, which I have for the present blended together, as they run insensibly into each other; and the peculiarities I have described are sometimes as distinctly marked in a tumour not larger than a pea as they are in one of twenty pounds weight, and differ materially from the forms of cancer.

I told you in the last lecture, that scirrhus affected particular organs more than others, especially the female breast and uterus; so also does a fungous tumour; but it is frequent in parts which are not usually the seat of scirrhus. Fungus hæmatodes is very common in the testis, while cancer of that gland is almost unknown. Fungus hæmatodes is frequent in the globe of the eye, and in the orbit, while cancer is rare in those parts; but cancer is, on the other hand, often found in the eye-lids or lachrymal gland. So indisposed, in fact, is the globe of the eye to cancerous ulceration, although so readily affected by the other forms of malignant disease, that you may see it quite surrounded and insulated, and hanging loose in a large and deep cancerous sore, without being itself tainted. Fungus hæmatodes is rare in the coats of the alimentary canal, which are frequently the seat of gelatiniform cancer. Still no structure, probably, is exempt from either of the diseases, though, perhaps, the contamination of fungous disease is less resisted by most structures than scirrhus may be.

Fungous tumours, like cancer, frequently arise from local causes. Here is a preparation, which was removed, when I was house-surgeon, from the breast of a groom, thirty years of age, five months after he ruptured some fibres of the pectoral muscle, in catching a run-away horse; the tumour began a fortnight after the accident, and was of the size of an egg in five weeks; then it grew more rapidly, and in four months from the accident it ulcerated, and a fungus as large as an orange, of which this is a section, grew from it, and the whole mass of the tumour was seven or eight pounds

weight. A tight shoe has been known to occasion fungous disease of the foot. A gentleman, a pupil of this hospital, three or four years since, pricked his finger with a needle, and fungus hæmatodes arose from the injury, which was speedily fatal.

But certainly fungous tumours are less frequently local in their effects than cancerous tumours. Either the system is more affected before any local disease is formed, or the secretions of the part are more easily absorbed, so as to contaminate the system, and the poison is less frequently arrested by the absorbent glands. This fact involves the important consequence, that you have much less chance of a successful operation than for some forms of cancer, and the disease generally appears in a greater number of places. For instance Mr. Keate removed a fungous tumour of the breast, in January, from a woman whose general health was so little disturbed that the disease was at first opened as for an abscess. Before she died in the following April, that is, in three months, twenty or thirty external tumours had formed in different parts of the body, besides extensive morbid deposits in several viscera; and these tumours seemed to present every variety of form, both of cancerous and fungous structures.

There is, doubtless, an original difference of constitution, which has something to do with the kind of malignant structure which is developed when a malignant diathesis is engendered. The patients, both with cancer and fungous complaints, become emaciated and unhealthy as the disease proceeds; but cancer chiefly appears in persons whose countenance is pale and bloodless when the system is affected, with sunken eyes, and a leaden complexion. Fungus hæmatodes, on the contrary, frequently appears, and grows to the size of a person's head, perhaps, in young people, stout, and with a fair skin and florid complexion, and apparently healthy constitution, for a considerable time. Mr. Travers expresses this circumstance by giving it as his opinion, that fungus hæmatodes is cancer in a scrofulous system; the delicacy of the skin and full development of the cutaneous circulation being, in such cases, like what may be observed in scrofulous individuals not immediately labouring under that complaint. At last, however, in all the forms of malignant disease, whether cancerous or fungous, there occurs that half-jaundiced complexion, and peculiar aspect, which the experienced eye detects without much difficulty.

Another circumstance which strongly demonstrates the different condition of the system, is the age at which the two genera of tumours respectively occur. Cancer, as we have seen, is a disease of the middle and latter periods of life, very seldom taking place under thirty years of age. Fungous disease, on the contrary, may appear at any age, but it is most frequent in young persons, and is seldom met with in mature years. Here is a plate of fungus hæmatodes of the eye in a child of eight months, and I have seen it in much

younger infants even than this. Still fungus hæmatodes may take place at any age, and you are not to regard the two genera of tumours as the same disease modified by different ages; for if an enccephaloid or fungus hæmatodes tumour take place late in life, the disease is just as characteristic as in young persons; except, indeed, as we might expect from the greater activity of their circulation, that the fungous disease is generally more rapid in its progress in younger persons than in adults.

Another circumstance in which the cancerous and fungous tumours are contrasted with one another, is, that the fungous tumour may be handled in general without its causing much pain, while the examination of the scirrhus tumour is sure to be followed by increased pain, even when you do so gently. During the progress of the fungous tumour, it is, in its first stage, much less attached than scirrhus to the surrounding parts, and it is insulated and confined by a cyst of cellular membrane, more or less condensed, allowing it to be freely moved, and more easily removed. The skin also is seldom fixed to the tumour till ulceration begins, and is seldom affected by this genus of morbid growths, while it is easily contaminated by scirrhus. These tumours have also large tortuous veins on their surface more frequently than other kinds of tumours, although this appearance is not to be looked upon as necessarily implying the malignancy of a tumour.

A striking difference between cancer and fungous tumours is afforded by the comparative rapidity of their growth. Scirrhus generally increases steadily for several years, and seldom attains any great magnitude, nor are the fungous growths from its ulcer very large and vascular. Fungus hæmatodes, on the contrary, may, in a few weeks or months, become as large as a person's head; or, having grown slowly for a certain time, will suddenly increase with frightful rapidity from some internal change in the tumour, or from the removal of pressure by ulceration, or other circumstances. A girl was, not long since, in the hospital, under Mr. Cutler's care, with a fungous tumour, of a mixed medullary and hæmatoid character, below the hip, a part of which by degrees protruded upwards under Poupart's ligament, and immediately, from the little pressure it was subjected to in the abdomen, increased with additional rapidity, and in about three weeks, I think, from its first being perceived, this part, which had only a narrow connection by vessels to the mass of the tumour below the pelvis, grew to the size of more than a foot in diameter. If the pressure is taken off by ulceration, an immense fungous mass is sometimes exposed, which bleeds most profusely from erosion of the vessels.

One reason of the rapidity of the growth of fungous tumours is the cells which are often intermixed with the solid part of the tumour, the fluid contents of which are more readily secreted to distend them, than the solid matter can be deposited and organized. Look, for instance, at these two

testes which I amputated. In a tumour of the breast, of encephaloid character, I emptied some of the cysts occasionally, from one of which, at a time, as much as six or eight ounces of fluid sometimes flowed. In a patient of Dr. Seymour's, lately, I gave great relief, for a time, by evacuating about four ounces from a cyst in a fungous growth in the abdomen, I know not of what organ.

Recollect, then, in examining tumours, the existence of cysts in those of a fungous character, and endeavour to ascertain the nature of the solid portions of the tumour, if there be any at the same time. But further, there is a frequent source of error in diagnosis, from the cyst-like division of a fungous tumour, when there is really no fluid; the semi-organized deposits in these separate portions feel pulpy, especially in the medullary kind, and are very often mistaken for abscesses. The distinction is chiefly this: the tumour feels firm and elastic, like fluid, when you press upon it, but does not fluctuate if you tap it on one side and press your finger on the other; and there is a difference in degree of solidity in the several parts of the tumour, one part feeling just as if there was fluid below, while another part is more solid and resisting. The testis affected with the disease will look and feel at first like a hydrocele, but a careful examination will show that it is somewhat irregular and tuberculated in its shape and consistence. If you are in doubt as to the nature of a tumour, you may puncture it, and then, if it be fungous, you will see nothing but a little blood, or serum, or gelatinous fluid, escape, and the resistance will be that of a body more or less solid. If you do puncture the tumour, and I know no harm in doing it, it should be with a grooved exploring needle, not with a lancet; the wound made by the latter instrument is liable to ulcerate, and the tumour inflames, and a fungus rapidly arises, which is not the case when the needle is used.

Another peculiarity in fungous tumours is of great consequence; they are sometimes, especially in the hæmatoid variety, very vascular, and very large vessels circulate within them. This is an important circumstance in the diagnosis, for the tumour may then pulsate exactly like an aneurism. There is in the museum, I believe, but I could not find it for you, a preparation of a tumour which was situated in the thigh of a woman, which pulsated everywhere like an aneurism, the pulsation being controlled by pressure on the common femoral artery. The surgeon whose patient she was, however, felt doubts upon the subject, and punctured it, on which a stream of arterial blood jetted out to some height; still he had doubts, and on other occasions punctured it again, with the same result. I was present when the artery was tied, as for aneurism; and on the patient dying a few days afterwards, it was found to have been a large hæmatoid tumour of the thigh.

A very instructive and interesting case has been published by Mr. Guthrie, in the 14th volume of the *Medical Gazette*, in which he tied the common

iliac artery ; and it is one of the few instances in which the operation has been performed with success. A lady had a tumour of the size of the head on the buttock, which was seen by several distinguished surgeons, of whom Mr. Keate was the only one who expressed any doubts of its being an aneurism of the gluteal artery. The operation having been done in August, the tumour diminished considerably, and the patient was supposed to have been cured of her aneurism. The tumour, however, returned, and she died in the following April, with an immense tumour of the medullary and fungus hæmatodes species mixed, which originated in the os innominatum.

It is fortunate when surgeons of distinguished reputation have the candour to publish their mistakes ; and all must make mistakes. Such cases, indeed, are not intended to justify carelessness on the part of those who are of less eminence, but they should teach caution to all in the exercise of their judgment, in practice as well as in prognosis, especially to the young, who are prone to think they know everything ; they should inculcate a lesson of charity, also, when mistakes are committed by others.

But this is not all, for you may be led into exactly the opposite error. Here is an enormous aneurism of the thigh, which looked like a malignant tumour, as it had no pulsation, except where the femoral and popliteal artery passed, not through it, but over its surface. I did not myself examine it very narrowly before it was amputated by Mr. Keate, for as mortification was beginning in the toes from its pressure on the blood-vessels, the operation was called for, whatever the nature of the tumour might be. A man had a tumour in the thigh, where the femoral artery enters the sheath of the triceps, into which an opening was made with the intention of dissecting out the fungous tumour that it was supposed to be ; but a coagulum was found, through which the arterial blood of an aneurism made its appearance, on the discovery of which I made pressure over the wound, while the artery was tied above. The patient afterwards got well. I believe I was the only one who suspected that the tumour was aneurismal ; and I mention the circumstance, that I may tell you why I formed the opinion, in order to guide you in similar cases. I believe that a fungous tumour pulsates like an aneurism, and you can alter its size by pressure ; but the diminution never seems to be in one part only, and on the removal of your pressure the blood never comes into the tumour again with the peculiar thrill of an aneurism : in this case, on the contrary, I distinctly felt a kind of central softer depression after I had pressed some blood out of the cavity, and there was a thrill on its regaining its former size, which thrill you may distinguish with the stethoscope, or the ear, when you cannot by the hand. Almost all aneurisms, in fact, even when most solid, have some fluid within them, which you can thus press out, unless the aneurism is under the process of natural cure. Even this, however, is not an universal rule, for Mr. Lawrence has published a case

in which he amputated the thigh, as for a solid tumour, but which proved to have been an aneurism, which had completely lost all pulsation, and could not be made to vary its size at all.

Thus, then, it appears that, in its first stage, a fungous tumour may occasion some doubts in your minds regarding its nature ; not so, however, when it reaches its second stage, that of local ulceration. When this begins, your patient will complain of more pain than he had hitherto experienced ; the skin becomes dark-coloured and more vascular, and then purple, and ulcerates and discharges a thin watery fluid ; then there arises a fungous projection, at first of the surface of the cyst inclosing the tumour ; then a slough forms, a dark yellow slough, perhaps, as in this preparation, or of a brown colour. The edges of the skin, perhaps, look thick, and welted, and everted, as is well seen here, but are still distinct from and unattached to the surface of the tumour ; while, on the contrary, no division can be perceived when cancer is thus ulcerated ; and although the discharging surface is foetid, the foetor is rather that of a gangrenous ulcer than the peculiar sickening odour which emanates from cancer.

A third stage commences as these sloughs separate, by which process the large vessels of the tumour are opened and bleed considerably, and irritative fever comes on. You see here the large tumour I have alluded to in the breast, in its second sloughy and fungous state ; in this preparation you see a tumour in the same situation in its third stage, which illustrates the mode in which a patient frequently dies of the disease. The wound had nearly healed, when a little tumour formed by the side of the cicatrix about three months after the operation, and in three months more it had formed a large bleeding and sloughing tumour, with prominent florid masses of granulations alternating with the sloughs, and the man died worn out with irritation, and pain, and loss of blood, and cough, and hectic fever. You may see all that had not sloughed away adherent to and implicating the upper ribs, and projecting into the cavity of the chest, with a portion of lung adherent to it ; and the pleura was also full of serum, which compressed the lung. Hydrothorax is, in fact, not an infrequent result of either cancerous or fungous tumours, and its existence must be well investigated before an operation is performed on any tumour on the chest. I have repeatedly seen a fungous tumour commencing in the rib itself, and care must be taken lest an operation be undertaken on the supposition of the case being only a tumour external to, and only attached to the rib, when it really, perhaps, projects almost as far within the chest as it does externally. I recollect a case in which a large soft swelling existed on the side of the chest, in a state of incipient suppuration, and with an impulse communicated to it by coughing, as in a case of empyema. When Mr. Keate punctured the tumour, a quantity of broken and dead pieces of bone, mixed with some pus, were felt

by the finger, and the ease proved to be really an instance of fungus hæmatodes of the ribs.

It is not only by hectic and irritative fever, or serous effusion in the chest or abdomen, that a fungous tumour causes death; witness many of the preparations on the table. In this case a man was admitted into the hospital under Mr. Keate, and you may see that the fracture is across a tubercle of medullary substance in the bone; indeed, it is not infrequent in the osseous texture. A few days afterwards he died suddenly of vomiting of blood, and you may perceive extensive disease of the same kind in the lungs and œsophagus, with a large ulcerated opening in the latter tube, from which the fatal hæmorrhage had taken place.

Here is a case of fungus hæmatodes in the bladder and prostate gland, for the hæmorrhage of which disease the high operation has more than once been performed, though unnecessarily as I conceive, since the blood can be dissolved and washed away.—Hæmorrhage again took place in this instance into the pericardium; and I have seen the same thing in the other internal cavities.—This medullary tumour was removed by Mr. Ewbank from the head of a young man, while I was house surgeon; but the disease returned, and proved fatal by stupor and other symptoms of pressure on the brain.—The same thing, or apoplexy, or watery effusion, will be the termination of such a tumour as this within the brain itself; and it is singular that the gentleman from whom I removed this hæmatoid disease had lost two others of his family with a similar disease, nearly in the same situation in the cerebellum.

When an external fungous tumour is situated on the thigh or trunk of the body, where it can easily gain skin from the neighbouring surface, it seldom ulcerates till it has attained a great size, and thus it frequently happens that the patient is carried off by some co-existing internal disease of the same kind, where its pressure occasions fatal results, or where it ulcerates more readily than the external tumour; a happy circumstance, very often, for the patient, who is perhaps spared the dread of hourly impending death from a bleeding surface, together with the annoyance and pain and suffering of a sloughing fœtid fungus.

The hæmorrhage, by which so many are exhausted in the progress of fungous tumours, is not merely the result of their great vascularity, especially in the hæmatoid variety, but is the consequence, as it would seem, of some peculiarity in the texture of the coats of the vessels; so that in an operation your patient may almost die of hæmorrhage under your hands, if you cut across a part of the tumour, while he will hardly lose any blood if the incisions are made just beyond the limits of the tumour, through the same vessels, of course, which transmitted the blood in the former case, but which have a contractile property, which those in the tumours are destitute of; the vessels in this respect resemble those of the vascular nævi.

And this peculiarity of the texture of the vessels influences also the hæmorrhage frequently observed in the interior of the tumour; the vessels, when congested, are easily ruptured, so as to cause effusion into the cells and cellular texture of the tumour. At the same time, I do not wish you to understand that the effusion of blood in the texture of a tumour is a complete proof of its malignancy; the same circumstance may doubtless occur in other tumours, if there is a similar brittleness of texture in their interior. So, also, the strangulation of a portion of the tumour during its irregular growth, and the consequent mortification of that portion, may occur in several kinds of tumours, perhaps, in the manner suggested by Dr. Hodgkin, which I explained to you formerly. But, whenever you see in a tumour of doubtful nature much disposition to internal effusion of blood, and to partial sloughing of portions of the interior, you should strongly suspect that it possesses a malignant character.

There is yet one other circumstance in the history of fungous tumours to be mentioned to you. The sloughing process occasionally pervades the whole tumour, and it dies. The patient is, perhaps, near dying too, but recovers from the dangerous constitutional symptoms he has laboured under, and the disease is cured, at least in that part. A man was under my care with a fungous tumour in the ham, originating in the femur; this ulcerated and then sloughed, after he had refused amputation, and was almost dying with the jaundiced appearance of malignant disease, and he left the hospital, expecting to die each hour; but having as great horror of being examined after death, as he had of the knife while living, and when it might have saved him. I saw him, afterwards, however, and continued the small doses of calomel and opium, with sarsaparilla, which I was giving him, and in six weeks the cavity in which both hands might have been put, filled up with granulations. He became stout and well enough to resume his occupation of a groom. Only half the tumour, however, had thus sloughed, the other part of the bone was affected, and six months afterwards he was again looking thin and haggard, and I dare say he did not long survive.

The history I have thus given you of the progress of a fungous tumour, applies chiefly to those in which the vascular *hæmatoid* species predominates; the well-marked *cerebriform* species is less vascular in its texture, and hence, perhaps, is less seen in very young persons than the hæmatoid; and its lesser vascularity influences its progress to a certain extent, so that it is, on the whole, rather less rapid in its growth; there is less hæmorrhage and sloughing in its interior, a less disposition to form cells of various fluids, and less bleeding from its surface when ulcerated, and from its structure when cut or torn in operation. It has been sometimes said, from its great resemblance to brain in appearance, that this form of fungous tumour originated in the nervous matter; but the opinion is quite erroneous, and the medullary

tumour really originates in every texture that the other forms affect, and the difference must arise from something in its growth which is not yet understood.

Fungus hæmatodes, and medullary tumours, are, however, often mixed in different parts of the same tumour, and a medullary tumour often changes its character as it proceeds, and a part of it becomes redder and more organized, and like the hæmatoid species. Here is a large tumour connected with the ligamentum patellæ chiefly, the surface of which became fungated, and bled enormously. I amputated the limb, and the patient died in a few days afterwards with hæmorrhage from the bowels and by the mouth. You may see that the base of the tumour is exactly like brain, while the projecting fungus alone is like fungus hæmatodes.

Still the medullary and hæmatoid species are not, as some have imagined, merely the first and second stages of the same tumour; each is often distinct and well marked at its commencement, and preserves its specific difference to its termination. The medullary form is not infrequent in the glands; and I recollect examining a patient of Mr. Merriman's, at Kensington, with an immense lobulated tumour, composed of a great number of glands, reaching from the upper part of the head into the mediastinum, which had destroyed a large portion of the parietal, temporal, and maxillary bones, with which it was in contact, by suppuration under their periosteum; and yet, when of this extent, every lobule was perfectly white and brainlike, and no portion had in the least assumed the characters of fungus hæmatodes.

The cerebriform species of fungus tumour is no less fatal and no less deeply rooted in the constitution, and no less universal in its appearance, than the fungus hæmatodes species; and I may observe, that if the tuberculated conglobate tumour is really a form of fungous tumours, rather than a separate species, it is to the medullary tumour of the glands, such as the case I have just now alluded to, that it is most allied.

Melanosis is a species of fungous disease which derives its name from the peculiar dark colour of its masses, which are black, or purple, or dark brown; and it was first described, I believe, by Laennec, as a separate affection from the encephaloid and hæmatoid species. This colour arises from the secretion of the peculiar coloured matter into the cells or cellular texture of the tumour or organ affected, and it varies in solidity from a semi-fluid consistence to a completely solid substance. Melanosis generally consists of a number of globular portions united together, as in these preparations, from the eye. The first case which I ever saw was a tumour of considerable size on the dorsum of the foot, which, from this form, and from its colour, looked exactly like a bunch of dark purple grapes, besides several other single tubercles which the patient had elsewhere. I well recollect the case, as I accompanied Mr. Ewbank, whose patient this woman had been, twenty miles into the

country, on an exceedingly wet night, and having our ardour in the pursuit of science rewarded with a positive retraction of the promise which had been given for us to examine the body.

Sometimes the whole surface of the body, as in this plate of Alibert's, or as in a patient who was a year ago in the hospital, under my care, whom some of you may remember, is studded with an immense number of little blue tubercles, like seeds in size. You may see the same appearance in this portion of the liver: sometimes it is in larger masses, as in this plate of Cruveilhier's; at another time, though not so frequently, it is seen in the form of a number of distinct round tubercles, as in this beautiful preparation of the liver, from a patient of Mr. Keate's. Here is the eye of the same patient, which was removed some time before her death, where the melanotic matter is mixed with other morbid structures of a different appearance. The disease in the liver showed itself not long after the operation.

Melanosis is very frequent in the eye, and it has been imagined that the pigment of the choroid coat might influence the colour and growth of the tumour, while the retina was supposed by the same persons to determine the medullary form of tumour. In reality, however, melanotic tumours are found in as many structures as the other varieties of fungous disease, and cannot be attributed to any peculiarity in the tissue affected. The disease has been observed not unfrequently in white horses; and Dr. Carswell has supposed that this circumstance may arise from the absence of coloured matter in the skin and its other proper tissues; but then, why should we see the disease in every colour of the human species, and not in albinos only?—and why is it not confined to the lungs, or to the eye, or rete mucosum? In fact, however, the nature of the colouring materials of melanotic tumours has not been well ascertained. Chemical examination shows us in them carbon, with some phosphate of lime and iron, but affords us no reason for the peculiar deposit, nor for the constitutional condition on which the formation of melanosis, as well as of the malignant growths, depends.

The structure of melanotic tumours is most like that of the cystic and other kinds of fungus hæmatodes; so that it seldom feels very firm, but I have sometimes seen the tumours very hard and solid when examined through the skin. Melanotic tumours have not the same high degree of organization that the hæmatoid tumours exhibit, there being a good deal of the secretion in the tumour, but the cellular texture is tolerably vascular.

Melanosis is equally fatal with either of the other species of fungous tumours; but perhaps its less organized condition is one reason why the tumours less frequently ulcerate and generate a bleeding and sloughing fungus than the others; another reason, however, appears to me to be the fact of the still more uniform malignant condition of the system, so that,

pervading more structures at the same time, the constitution sinks under it at an earlier stage of any one tumour than even in the other forms of fungous disease. Melanosis is, on the whole, a disease of later life than the hæmatoid variety, in which respect it resembles the cerebriiform tumour and cancer. It ultimately occasions the same emaciation and gradual sinking as other malignant diseases, with a fatal result from the affection of some internal organ,—sudden peritonitis or pleurisy, or ascites, or hydrothorax, or universal anasarca, as is beautifully shown in this picture of the disease in Alibert's work. A melanotic tumour is sometimes observed a longer time than a hæmatoid tumour before the final result, but is in general quite as rapid as that disease.

All the malignant diseases, however, are often mixed up together—melanosis with cancer—and both with the encephaloid and hæmatoid tumours. The last patient I myself had in the hospital came under my care for a tumour in each axilla, which tumours were of the joint characters of fungus hæmatodes and medullary tumour; and in a short time melanosis made its appearance most extensively, both in the integuments and in various internal organs.

The term melanosis is sometimes very improperly applied, even by pathologists as distinguished as Andral and Cruveilhier, to the collection of carbon often found in the glands of the bronchi, and to the change of colour produced in the blood by chemical agents. Of the latter kind is the blackness of the stagnant blood in the vessels of the intestines and peritoneum, from the contact of their contents, either before or after death; such, also, is the black vomit from effused blood, from cancer, or other ulcers, which erode the vessels of the stomach. Dr. Carswell attributes this to the action of the gastric juice and other acid secretions of the alimentary canal, whence the change is only observed in those situations, and proposes the use of the designation “spurious melanosis” for such appearances. You will recollect, however, when you see the appellation, that these forms of black appearance have nothing whatever to do with the disease melanosis as a fungous disease, to which, therefore, to avoid confusion, the term ought to be restricted.

Such, then, is an account of these curious malignant affections, as ample as our time will allow, in their several forms—fungus hæmatodes, encephaloid tumour, and melanosis. There are also some other trifling differences in the appearance of some tumours, which, at present at least, are not sufficiently distinguished to require notice as separate species. They are all, we find, allied, and, like carcinoma, are all incurable: and an operation for their removal alone offers any chance of permanent success. They may temporarily diminish under pressure, and iodine will also sometimes considerably lessen their size. Here, for instance, is a case of fungus hæmatodes of the rib, which appeared like a tumour of the breast, from its

pushing that gland forwards ; this was seen by Sir B. Brodie three or four years before the patient's death, and for a time its size was materially diminished. Relief is sometimes obtained by evacuating the fluid of the larger cells, by a grooved needle, as I have before mentioned.

Caustics afford the same means of destroying these tumours that they do in cancer ; they imitate, in fact, the natural cure by sloughing. They are dangerous, however, and have even less power than in cancer of destroying the whole tumour, their greater activity of circulation giving them, perhaps, more power to resist the action of caustic : hence the knife alone is the safe means of extirpation.

You may adopt the same remedies to retard the growth of the disease, and make the operation more successful, which I before recommended for cancer. Sarsaparilla and other tonics, sometimes with small quantities of bichloride of mercury, or, if the countenance is yellow and sunk, small doses of calomel and opium, a half or quarter of a grain of the former to half a grain of opium, night and morning ; and I have mentioned one case, in which, under this plan with sarsaparilla, a patient of mine rallied from the sloughing process, and got stout and well in health. Narcotics and gentle evacuants are also called for, as in all malignant affections.

Neither shall I detain you with speaking of local remedies, which are also to be of similar qualities with those which I spoke of in the last lecture as useful in cancer ; but you can do much less towards stopping the hæmorrhage and sloughing of fungous tumours than you can do in cancer.

In the last place, with regard to the propriety of operations for the removal of fungous tumours, somewhat similar rules are to guide your determination, since the disease is propagated nearly in the same way ; but still there are some modifications of your practice to be adopted.

1st. There is less contamination of the surrounding textures than there is in cancer ; there is often a complete cyst around the morbid structure ; and the textures of the skin are seldom adherent and diseased : consequently, there is much greater facility in removing the whole tumour. Fewer circumstances have to be inquired into with regard to the local condition of the disease, and the morbid structure seldom returns in the cicatrix, as it is so prone to do after operations for cancer ; unless, indeed, the ulceration is extensive, as in this tumour of the breast, in which, however, there is probably some admixture of cancer with fungus hæmatodes.

2nd. The disease is propagated, as in cancer, by the absorbent vessels. Here for instance, is a fungous disease of the testis, which I removed by operation, and I found distinctly the same white medullary fluid in some of the absorbent vessels of the spermatic cord, which existed in parts of the testis, and which was perceived still more remarkably in a large mass of fungous cerebriform tumour in the lumbar glands, from the effects of which the patient died soon after the

operation. In one case, indeed, Sir Astley Cooper informs us that he found the receptaculum chyli and thoracic duct completely filled with the same morbid matter that the testis of the patient contained, so that there was no more passage for chyle through it than there is in this preparation for blood to flow through the vena portæ; the respective fluids must in each case have got into the circulation by some circuitous route. I have also seen the absorbent vessels filled in the same manner by morbid matter from malignant disease of the bowel. But although the disease is propagated in this way, and the abdominal glands are very often affected by disease of the testis, still I think there is considerably less affection of the glands by fungous tumours in other situations, than there is in the cancerous tumours of the same parts; and you will often find the next absorbents unaffected by a tumour, while the malignant state of the system is shown by the occurrence of other tumours of the same or analogous character elsewhere. If they are enlarged, even when you have no evidence of disease in other situations, the operation is generally useless; but remember, moreover, that when the glands are perfectly safe, the chances are still great that you will find malignant disease in the viscera.

3rd. You should, therefore, devote more especial attention to the state of the general system, in order to detect, if possible, the simultaneous morbid condition of the lungs, or liver, or some other part. Certainly, I think, considering the whole history of the disease, that an operation is less frequently successful than one for cancer, bad, indeed, as is the prospect even there. Mr. Wardrop, in his observations on fungus hæmatodes, which well deserve your perusal, has collected a great number of cases, in not one of which was the patient exempt from a return of the disease a year after an operation; but then these cases are almost entirely instances of fungous disease in the eye, on which organ the operations are notoriously unfavourable. Certainly in other parts of the body, even when the tumour has been growing a longer time, it would appear that the life of the patient is occasionally prolonged. I have notes of a case which I well recollect, where the testis was removed by Sir Benjamin Brodie, and the section of the disease was considered by every one, at the time, to be a remarkably fine specimen of fungus hæmatodes; yet I know that this man was alive and well nearly five years afterwards. I know not how long he has subsequently lived.

A few such cases are a sufficient encouragement to us to operate, where there are no forbidding circumstances, though with but feeble hope of ultimate success. Even when the disease already exists in more than one part, yet if one tumour is ulcerated, or affects the system much by the irritation it excites, it may be right sometimes to get rid of this part of the malady. We thus retard that fatal result which we cannot wholly prevent. A gentleman, of whom I formerly knew something, had a tumour on the

thigh, which was so malignant in appearance that amputation was refused by several surgeons, although he was greatly emaciated, and dying of this tumour, while there were several others in other parts of the body not in so advanced a state. Sir William Blizard, however, performed the operation; and twelve years afterwards, when I last heard of him, he was still alive, even although two or three of the other tumours subsequently enlarged so much as to require removal at different times. These latter operations were performed by Mr. Lawrence, who has published the case as an encouragement to operate in cases of the tuberculated sarcoma of Mr. Abernethy, of which disease Mr. Lawrence considered the case an example, though it appears to me, from all I have heard of it, to have been more probably a modified case of fungous tumour.

It appears to me, however, as well from this case as from other facts in particular instances of fungous tumours, that there is probably some variety in the degree in which different cases are malignant, as there undoubtedly is in cancer, as it affects particular localities, and is modified by texture. Future investigations therefore, I hope, may determine more precisely the several species and varieties of these malignant affections than our present knowledge enables us to do; and by greater accuracy in laying down the appearances of the tumours, and the states of system attending each variety, to guide us in resolving in what cases an operation is proper to be performed, as affording a tolerable chance of success; and under what circumstances, on the contrary, it is to be avoided, as likely to aggravate the morbid condition of the system. In the skin especially, I have seen a few tumours (in which texture cancer is less virulent than in most other textures), of the nature of which I could not feel certain, but which I have suspected to have been some rarer forms of fungous tumour of this texture. Here, for instance, is one like a mushroom in shape, which was attached to the skin of the thigh by a narrow pedicle, the surface of which having ulcerated, bled repeatedly, to the extent of above half-a-pint at a time, though the vessels which I divided in dissecting it off were not remarkably large; but its texture is not distinct.

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LECTURES ON TUMOURS OF THE BONES,

Delivered at St. George's Hospital in 1838.

LECTURE I.

- I.—ENCYSTED TUMOURS OF BONES: 1. Hydatid Encysted Tumours; 2. Serous Encysted Tumours.
 II.—EXOSTOSES: 1. Osseous or Laminated Exostosis; 2. Cartilaginous Exostosis; 3. Ivory Exostosis.

WE have not time, in our present course of a hundred Lectures on Surgery, to discuss every subject in equal detail. On some points this minuteness is

less necessary, because there is some well-written work to which we can refer you for future study. On other subjects a great deal has been written, but not well-written, and more pains are necessary on our part to guide you through the confusion you will meet with in your reading. Of some other subjects, again, very little is known, and more detail is required to explain to you what we have ourselves worked out to clear our own way in practice.

Both the two latter qualities characterize the subject of the tumours of the bones, the account of which in surgical works is, on the whole, very unsatisfactory. I purpose, therefore, in the present season, to enter into a more detailed account than usual. As with other tumours, a good deal of confusion has arisen from the same names being employed in different significations. For example, there is an excellent paper by Sir Astley Cooper, which he has published with some other essays by Mr. Travers and himself, which, like everything else from his pen, contains a good deal of practical information. In this essay he divides all tumours of bones, in accordance with their origin from the outer covering or the cancellous structure, into *periosteal* and *medullary* tumours. But what will you usually understand by a medullary tumour of a bone? Doubtless one form of fungous disease, of a malignant nature—the medullary or encephaloid, from its resembling brain; yet Sir Astley was well aware of there being different tumours, all arising from the medullary membrane, some of which only are fungous and malignant.

So, again, with regard to the essential nature of tumours of bone, Sir A. Cooper only adopts two divisions, which he calls the *cartilaginous* and *fungous*, which are nearly equivalent in their course to the terms innocent and malignant; but there can be no doubt that malignant tumours of bones are sometimes quite hard, and fibrous and cartilaginous in their origin; while other tumours may shoot out a most luxuriant bleeding fungus, and yet have nothing malignant in their nature, so that they do not affect the absorbent glands, nor the constitution, so as to occasion a return of the disease in any other part after the removal of the original tumour.

You will recollect that all the results of mere inflammation, or simple solidification, are to be excluded from the definition of tumour. Here are examples of periosteal and osseous nodes, forming considerable elevations, which are often called *exostoses*. Here is a large bone with numerous irregularities on its surface; and in this preparation you may see the interior quite solid where there ought to be cancelli, presenting an example of what is called *enostosis*. But all these alterations of structure are the effects of inflammation, which are subject, to a certain extent, to medical and local treatment, and may altogether disappear. In a case of necrosis of the lower jaw, for instance, you may see a large swelling, an inch thick, round the original bone; but remove the dead bone, and this swelling, as large as the

fist, may be absorbed, so as to restore the natural form of the part, as soon as its local cause is taken away. A tumour, on the contrary, is the result of a new action, which is scarcely ever much obedient to remedies; it may sometimes be absorbed, from some cause as much unknown as its origin, but seldom in consequence of our remedies.

The tumours of bones originate (like inflammation), sometimes from the periosteum, at other times from the vessels of the medullary membrane in the cancelli, so that they may be situated entirely on the outside, or on the inside of the bone; but just as in this enlarged and inflamed bone all the texture is affected, so that you cannot tell where the inflammation commenced, so it is also with tumours; they may begin exclusively in one part, but generally spread from one part to another, so that it is impossible to describe the tumour as being periosteal or medullary, to use Sir Astley Cooper's terms.

The tumours of bones are analogous in many respects to those of the soft parts; I divide them, some of you may recollect, into three divisions:—1st, the *encysted tumours*, in which a cyst of fluid forms the chief characteristic; 2ndly, the *osseous*, of which bone forms a main feature; and 3rdly, the *sarcomatous*, in which the proportion of solid substance is so considerable as to give a character to the tumour. So also is it in the bones: you have 1st, *encysted tumours of bone*; 2ndly, *exostoses*, of which bone is the chief ingredient, or the cartilage, which is the nidus in which most bones are formed; and 3rdly, *osteo-sarcomatous tumours of bones*, in which there is more or less osseous material, but mixed with a large proportion of other solid structures.

I.—First, then, of encysted tumours, of which (independent of local causes) we only meet with two genera like those of the soft parts—viz.: 1. Hydatid encysted tumours; 2. Serous encysted tumours.

I.—1. The Hydatid tumours contain entozoa, of the same kind as those which are met with in the liver and other soft parts; and they are developed chiefly in the cancellated structure, as they are also in the cellular membrane of the soft parts. It is possible, however, that they may form in a cyst under the periosteum; for in opening an imperfectly-formed abscess connected with this diseased elbow, which I afterwards amputated, I let out five or six rounded bodies, in every respect like small hydatids in appearance, in contact with the ulna, but without any connection with the joint, nor apparently with any bursa.

It would appear that the hydatids form a bed for themselves in the cancelli, and that one or more membranous cysts are generally developed around them, the hydatids themselves being contained within, but not attached to the cyst, to the number of a hundred or more in this preparation, in which there were some also without any regular cyst around them. As

the cyst and its secreted fluid, with the hydatids floating in it, increases in size, the outer shell of bone is expanded, presenting a smooth and not very irregular surface of thin bone, or bone mixed with membrane, which yields in some parts, so as to give a sensation of crackling, like parchment.

Such was the appearance in the young woman from whom these casts of the head were taken, and who was in this hospital some years ago, under the care of Mr. Keate. The tumour was about four inches and a half by four in diameter, and had been forming for six years, but had latterly occasioned symptoms of internal pressure and irritation, intense headache, vertigo, and so on. Mr. Keate detected the fluid cyst, and laid it partially open by operation, and subsequently endeavoured to destroy the cysts by *kali purum*, which occasioned some tedious exfoliation, after which it was allowed to heal. Two years afterwards the cyst, which had continued to discharge a thin limpid fluid occasionally, was observed to be spreading under the outer table of the bone, and was therefore again laid open more extensively; and now, for the first time, hydatids came away from several cysts, about twenty-eight altogether thus escaping. All the bone was removed which covered the cysts, and in time the parts healed, leaving the cavity you may see in this other cast; and the patient continued free from the complaint, and in good health, twenty years after the operation.

Now this appears to teach us practically that we may sometimes expose the cavity, and if there is more than one cell, that the whole must be freely opened, and that till every part is destroyed (the containing cyst, as well as the hydatids), there may be a fresh generation of these bodies. It informs us also that the operation may be sometimes successfully performed even in the cranium, and that hydatid encysted tumours are not in themselves dangerous.

But we must not always expect the operation to be thus successful. Sir Astley Cooper, according to his essay, has only met with one case of hydatid tumour of bone under his own observation. This was a tumour of the tibia, soft, and diminished by pressure, some of the fluid being probably absorbed in which the hydatids were floating. The tumour was opened by Mr. Lucas, and numerous hydatids evacuated; but such violent constitutional disturbance ensued that the limb required to be amputated. When large, therefore, and the bone much excavated by the growth of the tumour, immediate amputation or entire removal of the affected bone is probably to be preferred to an opening of the cyst.

Sometimes, however, the hydatids must be altogether inaccessible; as in the case from which this preparation was taken. You may perceive a cyst chiefly in the spinous process of one of the dorsal vertebræ, which is almost entirely destroyed, and the sac has thus laid two of the foramina for the nerves into one, in which a cyst was contained, having above a hundred

hydatids within it, while there were also a few others in the cancelli elsewhere. The bone around the cyst is perfectly healthy, but the tumour projected inwards upon the spinal marrow. The patient, in consequence of this tumour, had some of the symptoms of diseased spine for several years, with a projection of the spinous process, somewhat like that of caries.

Thus, then, the hydatid encysted tumour is an innocent tumour, sometimes curable by operation, but it is very rarely met with in practice.

I.—2. The second genus of encysted tumours of bones, are the Serous or cellular tumours, as they are sometimes called. Like the serous encysted tumours of soft parts, they occur in the cellular—*i.e.*, the cancellated structure; the shell being expanded by the growth of one or more cysts, the osseous structure sometimes projecting inwards, so as nearly to divide the cyst into separate partitions, while the rest of the bone retains its natural appearance. The disease is, in fact, a mere expansion of the sides of the bone, as you may here see, into an osseous cyst, or the shell of the cyst is partly bony and partly membranous. The contents are either a simple watery or slightly mucilaginous liquid, transparent or coloured, and sometimes opaque, like currant-jelly; or a semi-fluid substance, like adipocire, steatomatous; or sometimes a more solid, brittle, soft, yellow substance, which has no adhesion to the cyst, and is evidently a secretion, though it looks at first, on being opened, like a solid tumour of malignant character. Dupuytren calls the tumour *fibro-cellular*, which appears to me a bad name; since the fibrous structure, which he compares to the tumours of the uterus, is rarely met with in cysts of the bone. Dupuytren, as usual claims the credit of their discovery. “Il-y-a déjà longtemps, que j’ai démontré pour la première fois, &c.” In reality, however, they have been better described previously by Delpech and other writers. These encysted tumours of bones are doubtless one of the forms of disease which you will find described under the old name of spina ventosa, which includes also, however, abscesses and cavities in the cancelli, formed from want of use of a limb.

The situations in which these cysts are met with are sometimes the ends of long bones, but most frequently the upper and lower jaw-bones. Dupuytren has met with the disease in the vertebræ. I think I have seen it in the scapula also, but not opened to verify the fact.

The serous encysted tumours of soft parts are often called hydatids, which they resemble in some respects, but in the bones there is seldom a lining membranous cyst capable of separation from the bone, so as to produce the same resemblance in that texture to what you find elsewhere. There is, however, in the Museum of the College of Surgeons, the humerus of an ox, “whose medullary cavity is filled with a glossy semi-transparent cyst, resembling an hydatid, which contained fluid.” The cyst is about twelve inches long, and nearly three broad at one part, where it projects through a

hole made by absorption in the bone, and it has two prolongations into the condyles, each nearly three inches long. It is almost loose at present, and certainly looks very like an hydatid, though the words (I believe of Mr. Hunter) which I have just quoted, would show it to have been probably a serous cyst.

These tumours sometimes arise from blows; but as they so frequently occur in the jaws, they would seem in that situation to arise from some peculiar affection of the teeth in the cellular structure at the bottom of the alveolus; and their origin is shown in an early stage, by the cyst being sometimes drawn out entire with the tooth, which is perfectly sound, though painful, or has a little portion of solid bone at the root of the fang. If it is at the side, the alveolus is absorbed, and there is a little hole which opens and discharges; or it suppurates and becomes fistulous and incapable of healing till the cyst is destroyed. More frequently the cyst is between the laminae of the alveolus, and forms a tumour in the jaw below the teeth, the sides of the jaw being expanded on one or both sides. When the tumour has grown to the size of this preparation of the lower jaw, its origin cannot of course be determined, though it doubtless arose from the same cause. In one instance, Delpech punctured a cyst containing as much as three ounces of liquid in the upper jaw, and yet the cyst was still quite separate from the cavity of the antrum, the floor of which was pushed up by the growth of the tumour below, which was connected with the canine tooth. You will find, by-and-bye, that the antrum also often becomes distended with fluid, in consequence of the irritation of a tooth which has not perforated the gum.

The symptoms produced by a serous cyst in a bone are some inconvenience, and sometimes a little pain; but it is on the whole an indolent tumour, whether in the chin or side of the jaw, or cheek, or tibia, which is smooth, and generally elastic, even when of small size, though sometimes it feels as though it were quite solid bone. When of a large size, the cyst may become quite membranous in parts, or more usually it is partly bony and partly cartilaginous, so as to crackle under pressure like parchment. When in the upper jaw, it cannot always be distinguished from enlargement of the antrum, and in either jaw it occasions considerable deformity; and from the appearance of what is before you, containing many ounces of fluid, you may easily understand that it will interfere materially with speech and mastication, respiration and deglutition. It does not affect the teeth, however, and the skin retains its natural appearance, and it has scarcely any disposition to inflammation. The mixture of bone with elastic substance gives the tumour some resemblance to fungus hæmatodes; but the crackling of the cyst is generally a good distinction, as the circumference of a fungous tumour seldom possesses enough cartilaginous and bony material to produce this

sound, however elastic it may be. In all doubtful cases, however, you will do well to puncture the tumour, to ascertain if there be a fluid within it. Serous encysted tumours may occur at any age. I am now attending a child of five or six years of age, with a small one; and they are most common in young persons about the jaws, as you might anticipate from what I have mentioned of their pathology. The operation was performed on the patient from whom this jaw was taken at forty-five years of age.

The treatment of serous encysted tumours of the bones is the same as that of the similar tumour in soft parts, but must vary according to the size and situation of the tumour. I can only speak myself, however, of those of the jaws, but I conceive the same principles should guide us in those situated elsewhere.

1. They may in the first place be cured by the extraction of the tooth or teeth situated above them. I have seen within these few months a young lady, with Sir Benjamin Brodie, who was just beginning to change her teeth, and had a tumour about the size of a walnut below the two right incisors. We agreed to try the chance of the removal of the teeth, which were still firm, and Mr. Nasmyth extracted three of them, one of which probably communicated with the cyst, as there was a discharge of watery fluid for about three days; the slight pain and thickening of the membrane over the tumour, which generally accompanies its rapid growth, subsided in a few days more, so as to diminish the prominence of the cyst when looked at through the lip, and in four or five months the bony parietes returned very nearly to their natural shape. The same thing may sometimes be done in an adult, but it would be wrong if the teeth are sound, to extract them unnecessarily, as the tumour may be cured without their loss.

2. The cyst may be opened, which is generally easily done with a strong curved knife, such as I here show you, as the shell is thin or semi-cartilaginous: and the whole of the covering should be removed, if the tumour is a small one, or a large opening made in the centre, where the cyst is very extensive; and this opening may be made from the mouth, so as to avoid all scar, the membrane being first separated from the surface of the cyst. Into this opening a little lint may be inserted, to prevent the food lodging in the cavity, which should be changed from time to time. The secretion of the cyst soon becomes purulent, and may be washed out by injecting some warm water; and if the lining is thick, and indisposed to change its action, the stimulus of a little sulphate of zinc or caustic will hasten its obliteration, which is effected partly by granulation and filling up of the cavity, but chiefly by the slow modelling process of interstitial absorption. In this manner the walls of a very large tumour are removed in the course of half a year or more, so that you would scarcely recognize the features of your patient.

3. If the lining membrane be very tough and fibrous, such as Dupuytren seems to have found more often than other surgeons, it must be destroyed completely by stronger applications, such as kali purum, nitric acid, or the actual cautery, and the separation of the cyst in this manner will necessarily be often followed by exfoliation of part of the bone. I do not think, however, that this method is often required.

4. Where the contents of the cyst are of a half-solid consistence, it must be carefully scooped out, and the surface destroyed in the way just described, the sound bone around it being exposed; and I should recommend its being very carefully examined both at the time of the operation and subsequently to it, lest an error should have been committed, by one of the cysts of a fungous tumour being mistaken for a serous cyst.

5. But, lastly, if there is any doubt in your minds as to the nature of the disease, or if the bone is materially altered by the growth of a very large tumour, its removal or amputation becomes sometimes necessary. In this very large cyst of the lower jaw the operation was thus performed by Sir Benjamin Brodie a few years ago in this hospital, on a woman 45 years of age, whose disfigured appearance previous to the operation is seen in the cast. This very large tumour had commenced 18 years before, as a small hard lump, which six months previous to the operation had only attained the magnitude of a hen's egg, but then increased with great rapidity, and was as large as the fist, and reached from the incisor teeth to the condyle, and materially interfered with the various functions of the mouth. About four ounces of transparent fluid were evacuated in the operation, which consisted, as you may perceive, of the division of the bone near the centre of the chin, and its disarticulation from the glenoid cavity; it was attended with very great hæmorrhage from the internal maxillary artery, and the external carotid was tied while she was quite faint from loss of blood. The patient went on very well for a few days, when she was unfortunately attacked with fatal erysipelas.

The excision of a part or even of the whole of the upper or lower jaw bones, is an operation which has been very often performed of late years; nor is it difficult or dangerous in its execution in general, in properly selected cases. For this particular disease, however, the whole thickness of either maxilla is very seldom required to be removed, as the bone itself being healthy in its structure, the cuts in the bone may commonly be so made, by perpendicular incisions met by a transverse one, or by some other modification, as to save the base of the lower jaw, or the more intricately connected parts of the upper, and so to preserve much of the natural form of the part, after the recovery of the patient. It is performed by various forms of small saws, and cutting forceps, of which you may here see several, adapted to different shapes and situations of the tumours, and it is unnecessary to detain

you in speaking of the operation itself, which will be in part shown you by-and-bye.

Let me caution you, however, not to undertake these operations on the supposition of their being solid bony tumours, till you have very carefully ascertained that the case in question is not one of these serous encysted tumours : always puncture them before the operation, lest the parietes being osseous, and therefore not crepitating on pressure, should have made you erroneously imagine you had a solid tumour to remove. M. Gensoul, of Lyons, in a very good essay upon tumours of these two bones, describes with great candour one case, in which he had actually made his external incisions of the cheek, for a supposed solid tumour of the superior maxilla, when he fortunately opened the cavity of the antrum in doing so, and the fluid contents escaping, he recognized the glairy secretion of this cavity, with the canine tooth adherent to the bottom, and thus saved his patient from the remainder of a very severe operation. The same mistake may easily be made with serous cysts, as with this, which may be called the *mucous encysted tumour* of the antrum. In a doubtful case, therefore, it will always be a wise precaution to remove a portion of the outer shell of bone first, so as to enlarge it, if the contents prove to be fluid, and so effect a cure ; or to go on with the excision, if the interior of the tumour proves to be of a solid nature.

I have mentioned that I can say nothing from my own observation of serous tumours in other bones, but I presume they are to be subjected to the same treatment ; that is to say, to a free opening, if of moderate size, and to amputation if they occupy much of the interior of the bone.

II.—The second order of tumours of the bones are the *exostoses*, consisting entirely of osseous structure, or with a certain mixture of that cartilaginous texture out of which natural bone is chiefly formed ; and the exostoses differ from each other according to their degree of consistence, so as to be divisible into three genera, the osseous, cartilaginous, and ivory exostoses.

II.—1. The *osseous* or *laminated exostosis*, is a growth from a bone, having the outer lamellæ and the cancellated structure of that bone expanded, as it were ;—the exostosis being very nearly of the same texture as the rest of the bone from which it grows, but generally with a somewhat thinner laminated shell, and less numerous cancelli. Immersed in acid it shows no difference from the rest of the bone, having the same firm animal substance as the nidus for the deposition of earthy matter. It is a kind of addition (like the trochanter when perfectly formed) arising from some disturbed action in the vessels of the bone, differing however from ordinary inflammation. The exostosis is sometimes (as you may see by these diagrams), (*a*) a broad expansion of the affected part of bone,—(*b*) sometimes it is a rounded tumour, attached by only a narrow pedicle to the bone, in which case the cancelli of

the neck of the tumour are often obliterated ;—(c) sometimes it has an arched form, there is a double root attached to the bone, while the intermediate part of the original bone is of its natural size ;—(d) sometimes again the outline of the tumour is very irregularly formed, with several projections.

The osseous exostoses are met with in various situations ; in fact, almost every bone has been seen to form them—the long or flat bones, the large or small ones, the face, the orbit, the vertebræ, the ribs, the pelvis, the extremities ; but it is on the femur and tibia that they most frequently occur—on the femur near the insertion of the triceps to the inside of the bone—on the tibia near the insertion of the gracilis and sartorius muscles.

Their number varies very much, several being often seen on the same person. I recollect a girl in this hospital under Mr. Keate's care, with an exostosis nearly of the size of a swan's egg on one fibula, with a sharp one on the femur, another on one radius, and a fourth on the metacarpus ; and I remember another patient of Mr. Ewbank's, who had eight or nine exostoses, and, what was curious, several of these were on exactly the same part of the same bone of the two sides—the two radii, ulnæ, and fibulæ.

An osseous exostosis is not generally difficult to discover, even at a considerable depth ; occasionally, however, they are covered by a bursa to protect the muscles from injury, giving a greater degree of softness to the tumour ; and I have known them appear to be moveable, when under a tendon. Sometimes, on the other hand, a soft tumour bound tightly down by periosteum appears to be formed of bone, especially when deeply situated in the orbit.* I remember a boy who came into this hospital under Sir Benjamin Brodie, and an operation was begun as for the removal of an exostosis in the upper part of the orbit ; but when the incision was made, there appeared this piece of burnt wood, nearly an inch long, and half an inch wide, to the great astonishment of the patient, who was aware of having received a blow by an explosion from a torch, I think a month before, but had no idea that anything had penetrated the skin.

Exostoses are in themselves innocent, and of no importance, the effects they produce depending on their situation : they usually occasion little pain or inconvenience : but sometimes, when accidentally inflamed, or when growing rapidly, the pain is considerable ; so also is it when the muscles are much stretched. They are usually found near tendons, which have their action impeded by them ; sometimes with much pain. I have seen a man with an exostosis on the fibula, and the nerve being stretched by the tumour, it used to occasion so much pain as quite to throw him down. This portion of cranium has several small exostoses on its inside, and was taken from a

* Such a case, for instance, is described by Dr. Mackenzie, a scirrhus tumour of the orbit being operated on with the idea of its being an exostosis.

woman in this hospital, who had been subject for some years to epilepsy, occasioned perhaps by these irregularities of bone, as they have been met with in similar cases. Sir Astley Cooper describes a case of exostosis of the fibula, which quite enclosed the peroneal nerve, occasioning paralysis below and requiring the division of the nerve in the operation. I have heard of a case some years ago in which the attendants expected to be called on to perform the Cæsarean section from an osseous tumour in the pelvis, from its so much impeding the process of parturition. Pelletan met with an exostosis of the pubis produced by the blow of a chair, in which his patient was not pregnant indeed, but every attempt to become so occasioned such horrible pain that an operation was performed for the removal of the tumour. Sometimes, again, an exostosis of the pubes has interfered with the discharge of water through the urethra. A curious case has been published, which you will find in Dr. Mackenzie's valuable work on the Eye, in which the whole circle of the bones of the orbit formed a kind of exostosis four fingers breadth in height, with the eye deeply sunk in the centre; and the same author has witnessed a case of protrusion of the eye, which caused such violent pain of the head and eye, that the eye was extirpated; an exostosis being then seen at the bottom of the socket, which very prudently was not meddled with. Such effects may, of course, be occasioned by either kind of exostosis.

When an exostosis has once formed, it may increase to an indefinite extent; but an osseous exostosis seldom acquires any great size, and very often ceases to grow, and remains of the same bulk for the rest of the patient's life. If very large, the skin sometimes, but rarely, ulcerates over the tumour, but not unhealthily.

II.—2. *The cartilaginous exostosis* is not so common as the last, and varies more in its mode of origin.

a. Sometimes it grows from the periosteum; and in that case has a central basis of somewhat harder bone, of more imperfect figure, and with less cancellated structure, than the osseous exostosis; but in addition to this, the bone has a cartilaginous covering, varying in thickness from a thin layer to an inch or more in depth; the cartilage being half gelatinous and semi-transparent, and the periosteum is very imperfectly traced over it, and into its substance.

The cartilaginous exostosis affects the same situations as the last form. Here, for instance, is a very good one from the inside of the femur. Sir A. Cooper says he has never seen an exostosis of the scapula, but the *Medical Gazette* lately has contained an account of one of the cartilaginous kind in that bone. Even the os hyoides generates this form of exostosis, according to a case in Dr. Warren's work on tumours.

It is remarkable that they are generally single, instead of being so numerous as the osseous variety; but not always so; for the lad from whom

this tumour was removed from the thigh had two or three of the same species. Here is a curiously irregular cartilaginous tumour, which I took after death from a man who had an ulcerated hip-joint, the irritation of which had produced the tumour on the pubes, over which the vessels were raised to a considerable height, with pulsation apparently in the tumour. The diagnosis of the cartilaginous exostosis is not quite so easy as that of an osseous one, from the soft covering it possesses, in consequence of which a bursa is not formed over it. Still it can generally be discovered by its figure and attachment, with a hardness greater than that of an osteo-sarcomatous tumour, and less than that of an osseous or ivory exostosis.

b. There is a second species of cartilaginous exostosis, which is not described as such to my knowledge, and which appears to me to arise also from the periosteum in the first instance. This macerated preparation shows you an apparently simple enlargement of the humerus in the greater part of its length, and in its whole circumference, which, with the cartilage, formed a large irregular mass in the arm of a patient of Dr. Hewett, in this hospital, who never made any complaint of it, and in whom it was accidentally discovered after death. It is now, as you may perceive, double the size of the other; but when I took it away the mass of irregularly shaped cartilage which covered it, and filled up the cavities of the bone, made it altogether as large as the fist in the middle of the bone, gradually tapering towards the condyles of the head. You may satisfy yourselves that there is a quantity of new bone round the original shaft, which is nearly of its proper size; and that the mass around it is not merely the result of inflammation is evident from the quantity of cartilage on the surface, and from the entire absence of symptoms of inflammation; at the same time the morbid action has extended into the interior, so as almost to obliterate the cancelli by osseous deposit. Very nearly at the same time that this fell under my notice I saw another very large tumour of apparently the same kind in the same bone in a patient of Mr. Keate's, the upper half of the bone being here affected, so that it could only have been removed at the shoulder-joint: he, too, had never suffered the least pain or other sign of inflammation, and had the perfect use of his arm. This general enlargement round a bone is most often seen, however, in the smaller bones, as the phalanges of the fingers and toes, several of which are often affected at once. Here is a finger which I amputated lately, of which the first and second phalanges form a large mass of cartilage and bone round the original ones, the joints being perfectly healthy, but the original phalanx is in part absorbed, and its place, both shell and cancelli, occupied by new cartilaginous substance. In this humerus there is in the centre a bony exostosis, while here the central portion is cartilage; but occasionally the diseased action does not extend at all into the interior, for I have seen examples of new osseous formation, probably of this

kind of disease, in which the new bone was quite loose, and revolved round the original bone, to which it had been attached by periosteum or other soft substance only ; its moveableness showing completely the origin of the tumour from the periosteum.

c. But while the osseous exostosis grows only from the periosteum, the cartilaginous species may, in the next place, originate solely in the cancellated structure of the interior of the bone, forming an irregular mass of new substance of the same soft yellowish white or nearly transparent cartilage as that which covers the bone of the periosteal cartilaginous exostosis, the shell being expanded to contain the new substance. It is perhaps owing to the original disposition of the vessels of the cancelli that this internal cartilaginous tumour has very little bone in general, I believe, compared with the quantity of bone in the external periosteal forms of the disease. I recollect some years since an operation performed by Sir Benjamin Brodie, in a little girl of 12 years of age, for a large swelling of the lower jaw, formed by one of these internal cartilaginous tumours ; the outer shell of bone being removed, the tumour, about two ounces in weight, was dug out of the bed in which it lay. This appeared a very formidable operation, from the great hæmorrhage, producing fainting, that obliged the proceeding to be twice stopped till she had recovered, though no important part was involved ; and it was curious to see how soon the jaw began to be remodelled in its shape.

d. There is, in the fourth place, a preparation in the museum of the College of Surgeons, of a cartilaginous tumour growing from the æthmoid bone, which shows that even the delicate periosteum and mucous membrane of that part is capable of forming such a kind of exostosis : it is of the size of a nut, and is accompanied with fibrous polypi of the nose.

I told you just now that Sir Astley Cooper divides all tumours of bones into cartilaginous and fungous, including all that are not malignant under the former name, and believing that the origin of all exostoses is a " deposition of firm cartilage, similar to that which forms the nidus of the original bone in the young subject ;" and that within this cartilage osseous matter is thrown out, at first from the surface of the bone, then in the mass, as the cartilage increases in size ; a layer of cartilage always preceding the deposit of bone, and when the process has ceased, there being only a layer of bone, but no cartilaginous covering ; this remark being applied also, I believe, by him to some osteo-sarcomatous tumours.

If this opinion were true, the cartilaginous exostosis, which I have described, would only be the early stage of the osseous : but I must differ from this opinion. It is not, however, in the first place, from cartilage that all the bones are originally formed ; witness the growth of the flat cranial bones, so that the precedence of cartilage is not necessary to the deposition of bone. Look to the formation of nodes again, and you will find pieces of bone which

are either loose in the periosteum, or attached to the bone; but the periosteum, instead of being cartilaginous, is fibrous, with fluid in its texture, very like the membranes of the cranium while ossification is going on. That some cartilaginous tumours may be osseous I do not deny; but I am persuaded that I have seen several osseous exostoses, while still growing, closely covered by periosteum, like a natural bone, without any intervention of cartilaginous matter; and I believe that the animal matter in which the bone is in them deposited, is rather a tough fibrous substance, like thickened periosteum, than the soft cartilage of the cartilaginous exostosis. I believe, in short, that the small osseous exostosis is perfect from the first, without any cartilaginous matter. Even if I could entertain any doubt with regard to this in the osseous exostosis, there can certainly be none with regard to the next species, the ivory, in which no cartilage can at any time be detected, while it is still obviously growing; and there is no more necessity for it in the one case than in the other. I may also allude to the usual though not invariable contrast between the two species; the single cartilaginous exostoses compared with the numerous osseous exostoses in the same individual, as some evidence of difference in origin, though perhaps the circumstance does not deserve much weight.

II.—3. The third species is the *ivory exostosis*, which is exceedingly dense in its structure, and of a high specific gravity. Its hardness will be evident from this example, which, although scarcely more than an inch in diameter, required, I am told, an operation of above an hour's duration, which was supported with great patience, and spoiled more than one saw before it could be sawn across. At the same time its composition is not very different from that of ordinary bone, according to a recent analysis of a tumour of this kind, compared with that of bone by Berzelius.*

	Healthy Bone. Ivory Tumour.	
Animal matter.....	33·30	28·57
Phosphate of lime, magnesia, &c.....	54·20	68·88
Carbonate of lime, alkaline, chloride, &c. ...	12·50	2·00
Loss	00·00	00·55
	<u>100·00</u>	<u>100·00</u>

That is to say, if you examine the table behind me, the difference is chiefly in the proportion of carbonate of lime, which is almost the same in the ivory exostosis as in the teeth, compared with ordinary bone.

The ivory tumour is seen best where it is most common, in the bones of the cranium, as in this preparation, where a tumour is seen growing in the frontal and parietal bones, evidently originating in the diploë, the tables being absorbed, both externally and internally, by the projection of the

* Guy's Hospital Report, vol. i.

tumour, and a thin edge of the tables being seen at the margins of the aperture which is thus formed. I have observed that the cartilaginous exostosis of cancellous structure has generally less osseous matter than that which derives its origin from the periosteum; and Mr. Lawrence, in his Lectures on Surgery, has expressed a doubt whether the cancellated structure ever forms a really osseous tumour. It is curious, however, that this, the most dense of all osseous tumours is most frequently formed by the diplœ or cancelli of these bones, instead of being formed in the membranes and tables of the skull.

I lately saw a tumour, which I believe to be of this kind, in the forehead of a gentleman, of the size of a nut, which had already been growing for several years; and it is generally, as you might expect, very slow in its progress, producing no pain, though liable to acceleration of rapidity by blows exciting inflammation. If it grows internally, as in the skull, it occasions irritation of the brain, and ultimately fatal symptoms in that organ, which was the case in the lady from whom this portion was removed.

Here are two other preparations of ivory tumour taken from the orbital plate of the frontal bone, at the edge of the orbit; and I well recollect the peculiar expression given to the features, by the proptosis and deformity they occasioned in the two young men from whom they were removed in the hospital.

Next to the cranial bones, the situation in which the ivory exostosis is most frequently formed is in the superior maxilla, around the antrum, where the ivory substance is sometimes deposited more loosely, as if crystallized, with partitions of animal matter, or sometimes mixed with cartilage, and growing to the size of the fist or more. In the first volume of the Guy's Hospital Reports is the account of a very curious case of this kind (or you may see the casts in their museum,) where a mass of ivory tumour spontaneously separated from the face, weighing $14\frac{3}{4}$ ozs., and leaving, as you may imagine from the plate, a hideous excavation in the face. The most extensive specimen of the disease, which I have myself seen, is in Mr. Langstaff's museum, and the case is published by Mr. Howship. It was in a man, who died at the age of 59, the tumour having arisen from cold fourteen years previously, and its growth having produced the most intense pain, as if his head was splitting asunder. Both his eyes were destroyed, and the orbit filled up, except just the aperture for the nerve, and the nostrils also are closed and blocked up by the tumour; and I observe that every bone of both sides of the face is more or less affected by the ivory deposit, and even where not changed into this structure the frontal, sphæroid, and other bones at the base of the skull, are thickened, as if the conversion was in progress. Even this is surpassed, however, by a case related by M. Jourdain, of the growth of such a tumour from the age of

12 to 44, where the lower jaw also was affected, which is rare, and weighed by itself 3 lb. 3 oz., and the whole skull weighed 8 lb 3 oz., while the ordinary weight of these bones is 1 lb. 12 oz.

I have sometimes seen new bone of ivory density in the femur; but I believe it is rare, except in some portions of osteo-sarcomatous tumours of the fibrous character, a part of which is often as dense as ivory.

The diagnosis of ivory tumours is more easy than that of the cartilaginous, from the absence of soft matter; their smoothness and rounded outline in the cranium, and hardness and irregularity in the face, distinguish them from the osseous exostoses, which are generally abrupt and sharp while growing. In shape they most resemble the encysted tumours which, we have seen, are also most commonly situated on the head and face; but their extreme hardness, without any yielding or crepitation, serve to guide your opinion. As to their situation, also, you seldom need expect a common osseous exostosis on the cranium and face, and still more seldom an ivory exostosis on the bones elsewhere.

Such, then, is a detailed account of the solid bony tumours, constituting three species of exostosis; and we have next to proceed to their general causes and treatment by medical or operative means.

LECTURE II.

Causes of Exostoses—Local—Constitutional—Hereditary—Malignant?—Treatment of Exostoses.—Medical Treatment; Operative Treatment.—1. Of Osseous and Cartilaginous Exostoses on the Exterior of a Bone; 2. Of Cartilaginous Exostoses in the Cancelli of a Bone; 3. Of Ivory Exostoses.

III.—*Osteo-sarcomatous Tumours.*

1. Fibrous Osteo-sarcomatous Tumours—(a) Solid; (b) Radiated; (c) Granular.—Formation of Cysts—Immense size—Diagnosis—Treatment—Malignant?—Excision or Amputation—Various Situations for the Disease.

THE causes of all the three varieties of exostoses which have been described to you are numerous:—they may arise from blows and other injuries; from cold; from pressure; as the sequel of common inflammation: they may arise from violent exertion, whence their situation frequently near the insertion of tendons; from the irritation of a diseased joint or tooth; but very often no particular cause for their production can be pointed out, except some peculiar unknown local action.

No doubt, however, there is frequently a constitutional condition on which they originally depend, whence they are sometimes numerous in the same individual, and by a change in the system the cause ceases, and they no longer increase in size or number. Hence, too, it often happens that there is at the same time a disposition for the conversion of soft parts into bone, as well as for the production of exostoses; as when tendons or ligaments are ossified, as in these preparations.

In a remarkable case published by Mr. Abernethy, this diathesis was so strong in a boy, that every blow or other injury would produce an exostosis, while many of the muscles and tendons, especially the *ligamentum nuchæ* and margins of the *axillæ*, were ossified, so as to fix his neck immoveably, and pinion his arms to his sides. The most extraordinary case of this combination, however, is in the skeleton of a Mr. Jeffs, in the museum of the College of Surgeons, who died at the age of 39, with half the muscles of his body ossified, in addition to numerous exostoses, and who must have been a wretched cripple, incapable of bending his body, or of moving hand or foot. But, although often combined in the same person, the two circumstances would not appear to arise from exactly the same condition of the system, since the ossification of the fibrous textures is chiefly met with in elderly persons with declining powers, while the exostoses are found most commonly in young persons, not exactly children, but while still growing, from the age of 10 or 12 to 20. There is in them an exactly opposite condition to the atrophy of rickets; a hypertrophy of the osseous system, occasioning these depositions of bone in irregular forms and situations. It seems, too, from observation, that, as in the *mollities ossium*, there is sometimes an excess of phosphatic salts carried off by the kidneys, so in cases of exostoses there is sometimes, but by no means constantly, a deficiency of saline material in the urine; there is an irregularity of action in those organs, the primary source of which, as in rickets or gout, is doubtless to be sought in the digestive organs.

The disposition to ossific deposits is, perhaps, sometimes so decided, as to be hereditary in families; for instance, Boyer mentions the case of a woman whose thigh was amputated for an osteo-sarcomatous tumour, and who had also several others in other parts of her body, which are not described as if they were malignant, whose father, brother, sisters, nephews, and children, I know not how many of them, all had bony tumours of some sort or other, and some of them several, on the ribs, tibia, or other bones. And Mr. Stanley, in his lectures at the College of Surgeons, said that he knew a man in St. Bartholomew's Hospital for exostoses, numerous exostoses having also been formed in two of his children, and in his father also previously.

There is yet one other circumstance connected with the constitutional origin of osseous deposits, such as was shown in a case under the care of Mr. Hunter, in this hospital; you may see in the College of Surgeons a very large bony tumour of the thigh bone, probably a fibrous osteo-sarcomatous tumour, amputated by Mr. Hunter, five months after its being detected, in which case, about a month after the operation, before the stump was quite healed, difficulty of breathing came on, which was fatal in three weeks more. You may see, further, numerous ossific deposits found in the *pleuræ*, half an inch or an inch in thickness, and several inches in diameter, some of them loose,

while others are attached to the ribs and to the surface of the vertebræ; and both lungs have great masses of loosely-formed bone in their parenchymatous structure, so large as to preserve the form of the lungs, as if they had been converted into bone, and of several pounds weight. This instance is sometimes called a proof of the malignant nature of exostoses and simple bony tumours; but it is a depraved state of constitution, as scrofula is, rather than a malignant condition of system. Exostoses do not exert any influence on the surrounding textures, nor on the absorbents; and Mr. Hunter's case is a rare exception to the general rule, as to distant parts. Mr. Travers once saw, he tells us, bone formed in the glands of the groin after the amputation of the tumour of the bone below; but the tumour was one of fungus hæmatodes, and the deposit of bone was conjoined with malignant substance in the glands, and was, I conceive, an accidental coincidence.

Next, then, as to the treatment of exostoses, which may be directed, in accordance with what I have just told you of their constitutional origin, to the state of system generally. It is probable, however, that when the diathesis is so strong as thus to occasion ossification extensively of the soft parts, the state of system is an incurable one. From the chemical examination of exostoses it is no wonder that acids, both internally and externally, should have been employed, but without any advantage from this empirical plan. But more probability exists of doing good from the study of the state of the digestive organs, and general health, of an individual labouring under exostoses, taking the condition of the urine also as one evidence of their morbid state. With many exostoses there is pain and some inflammation during their rapid growth, and the treatment of inflammation of bones is then likely to check their increase; and the patient may take alterative mercurials; a grain of calomel, with five grains of extract of hemlock, night and morning; or three grains of blue pill, and four or five grains of extract of rhubarb, every night; and these may be combined with sarsaparilla and small quantities of hydriodate of potassa, in weak persons, or those who are debilitated by the pain of the tumours. The mercurial medicines and sarsaparilla are recommended by Sir A. Cooper, in the essay I have alluded to; and they are useful, probably, where inflammation exists, as they also check sometimes malignant tumours. You can do good, too, by local means: when painful and rapidly growing, by warm plasters, mercurial, or of ammoniacum plaster, or by blisters; and if the exostosis is near the skin, by the occasional use of a few leeches, and by cold evaporating lotions. These measures seem especially useful in the hard osseous exostoses.

In cases of the external cartilaginous exostoses, it is probable that where the proportion of cartilage is considerable, their growth may be checked by the use of mercury and iodine. A man, about 40 years of age, came under

my care in the hospital, who had suffered such violent pain about the knee for five years, as to have been incapable of exertion during that time, and to have been in the habit of taking laudanum to the extent sometimes of a wine-glassful in the day, to gain some relief. Various remedies had been made use of to the knee, and he had been already in more than one hospital; but it had not been observed, even by the patient himself, that the lower half of the femur was nearly thrice its proper size, hard and knobbed in some parts, but with a good deal of firm substance, which I believe to have been cartilage in others; the tumour being, however, notwithstanding his intense pain, wholly free from tenderness or apparent inflammation. He rubbed over the thigh an ointment composed of one drachm of hydriodate of potash, with one ounce of the milder mercurial ointment, and in about two months was wholly free from pain, and a third of the swelling of the bone had disappeared, leaving only the ossific part. When he went to his employment again, there was a slight return of pain, and fresh formation of soft substance, and I took him in a second time for three or four weeks, with the same result, from using the ointment again. He did not return again, and I conclude he continued well. This tumour was so different from the usual appearance and symptoms of inflammatory growth of the thigh-bone, and so different also from any malignant tumour, that I am inclined to believe it was one of the general external cartilaginous growths, which I showed you in the last lecture, in the humerus; and as the same remedy sometimes, I believe, does good in the analagous formation of the fibrous osteo-sarcoma of the bones, it is at all events worth trying before removing a limb for such a tumour.

For the third species, the ivory exostosis, I conclude neither general nor local means would do anything towards checking its growth, but measures are sometimes required to obviate its effects upon the brain, when situated on the cranium.

I have next to speak to you of the operations which may be performed for exostoses; and 1st, as to the osseous and cartilaginous exostoses, when situated on the *external* surface of a bone. If stationary, and giving no trouble or pain, what I have already mentioned is all that should be done; but when, on the other hand, they are painful or inconvenient, or interfere with the functions of the parts among which they are situated, then an operation for their removal is required, nor is it difficult of execution; several of these exostoses before you have thus been excised. In healthy persons the wound may unite well, but very often suppuration is established, and if matter is confined the muscles are separated from their attachment, as the vasti from the femur. It is better, on this account, to cut through a muscle, when it is in the way, rather than use violence in holding the sides of the wound apart, and to put lint into the wound to prevent deep suppuration; in which

cases sometimes, especially in irritable constitutions, severe and even fatal symptoms are produced. This preparation, for instance, was removed from the inside of the thigh in a young man, who had great irritation from the operation and copious secondary hæmorrhage, from the combined influence of which he ultimately sunk. I recollect another exostosis, which was removed from the same situation, in which such copious suppuration followed the operation that the patient very nearly died from its effects. The surface of bone, where denuded, does not in such cases unite with the muscle in contact with it, and hence the mischief alluded to.

In performing the operation, you have to make an incision down to the bone, so as to lay bare the exostosis, and the edges of the incision being held aside by spatulæ or blunt hooks, a small osseous or cartilaginous tumour may at once be cut off from the bone by a straight pair of cutting forceps, of which a variety are before you, and which cut on different planes, according to the situation of the root of the morbid growth; and some of which are also made with compound hinges, with a view of giving them greater power. Where the exostosis has a broad base, you require a saw; some of which you may examine after the lecture: of these, one is worked, as you see, by a winch, and is circular, and has forceps to hold the tumour, and was invented by a Mr. Machin. Another is a chain saw, to act in a limited space, smaller even than the other. But what is better than either of these complicated instruments (the disadvantages of which will be apparent when you look at them), is a small, strong, key-hole saw, or Hey's saw, the teeth of which are made broad and set apart. Or instead of using only this instrument to saw through the whole base of the tumour, you may cut partly through it, and then break off the remaining attachment with a pair of forceps, or strong elevator, or chisel. The cartilaginous exostosis has its bony centre sometimes so fine in texture, or so small, as easily to be broken off by a little manœuvring with the chisel. I do not mean a chisel to be forced through by a mallet, but worked quietly in the hand, and used partly as an elevator. If you cannot break it off thus, the small saw or forceps will succeed in doing so with great facility.

Sir Astley Cooper proposed, as an operation for exostosis, the exposure of the tumour, and depriving it of its periosteum, so as to make it die and exfoliate. But I cannot conceive the necessity, in any case, of so tedious a process, and one that must be uncertain too, since the tumour has its internal blood-vessels, which may still keep it alive after the periosteum is removed. Wherever you could cut down on an exostosis, so as thus to denude it entirely, you could also, with even greater ease in most cases, remove it altogether. Some unusual situation for an exostosis may sometimes require anatomical knowledge; as, for instance, a cartilaginous exostosis of the os hyoides, such as Dr. Warren describes a case of; but the removal is seldom called for in

important situations, and must, I imagine, be always preferable to the mere exposure.

2ndly. When a cartilaginous exostosis is situated in the *cancellous* structure of a bone, as in a case of this kind in the lower jaw, which I related to you in the last lecture, you must expose the tumour and break it away from its attachment, opening the whole of the cavity in which it lies that you may be sure that all the tumour is accessible. The shell is usually thin enough to cut a hole through it with a strong knife, or with a trephine at any rate, which opening may then be enlarged by a cutting forceps or strong knife ; after which the cartilaginous mass may be dug out with an elevator or chisel. This was done in the case which I told you I had seen, under Sir Benjamin Brodie's care. Sir A. Cooper describes a similar operation of his own, in the same bone ; and he remarked the dental nerve and vessels lying at the bottom of the cavity. The shell of bone is remodelled surprisingly, in no long time after the operation.

3rdly. A cartilaginous tumour around the whole of a bone can only be removed by amputation ; as here I removed the finger, or as this tumour of the humerus must have been amputated at the shoulder-joint.

4thly. As to the *ivory exostosis*, the question of operation is more difficult. Ought you in general to meddle with them at all ? Recollect, as this example shows you, that in the cranium the tumour often grows internally also ; so that you can only remove the outer part, which was done for the portion of new growth here seen, and in which the tumour was ultimately fatal. I recommend you, therefore, if the tumour is quiet and not growing fast, to do nothing for it, even if it were for this reason only ; but if too troublesome to the patient to be thus left to itself, recollect that the tumour, from its extending through the whole thickness of the bone in most instances, can only be operated on with great risk and danger, even if you succeeded in the attempt. How is the removal to be effected, however ? I am inclined to believe, that, on the whole, exfoliation by caustic is the best, where the base is as usual broad, and the prominence not great, in consequence of the difficulty in sawing through so hard a kind of bone. This small piece required an hour's sawing to remove it, and spoiled more than one saw. The man from whom these pieces separated was in this hospital, under Sir Benjamin Brodie, with an ivory exostosis of the frontal bone, just at the edge of the orbit, which Sir A. Cooper had tried in vain to saw off horizontally several years before, the mark of which you may still see ; but by repeated applications of caustic it ultimately exfoliated. I recollect another patient, under Mr. Keate's care, nearly at the same time as this young man, with a similar exostosis of the frontal bone, both growing towards the orbit and occasioning proptosis ; in whom Mr. Keate made this perpendicular cut with a trephine, but was obliged to desist from the

hardness of the tumour. He continued to attend for several years, from time to time, and had various caustics applied, especially potassa fusa and nitric acid; and ultimately this large piece exfoliated; in which, owing to its extreme density, so little change has been produced that the hole made by the trephine is as distinct as when he left the operation room. The hollow left by the separation of the tumour, in both cases, produced so odd an expression of countenance, that I doubt if the patients thought themselves much improved by the cure, though it of course prevented the mischief that would have ensued if the tumours had continued to increase. There are other cases of ivory tumours on record which have thus exfoliated by the use of caustics and cautery; you may find some, for instance, of the orbit, in Mackenzie's work on the Eye; on the whole, probably, nitric acid is the best caustic, as it acts chemically on the bone, besides stimulating its vital action.

For the irregular masses I have mentioned to you as sometimes forming in several of the bones of the face at once, an operation is of course out of the question; for an ivory tumour of one bone only, as the superior maxilla, excision is practicable, while the boundaries of the morbid mass are distinct.

III.—The third order of tumours of the bones are the *osteo-sarcomatous tumours*, in which there is a mixture of a considerable quantity of soft substance of some kind or other with bone; and these tumours are of a most formidable character, from their growth, and the enormous size they sometimes attain, and from the destructive effects and malignant character of some among them. The term osteo-sarcoma is employed, however, very indefinitely. Sir A. Cooper recognizes no distinction between a hard simple exostosis, and an immense tumour of many pounds weight, with a great mass of soft substance mixed with the bone it contains. Provided these tumours are innocent, he calls them all cartilaginous exostoses, though sometimes nothing like bone or cartilage is found in them; and all the rest of the tumours of the bones, whether periosteal, or originating in the cancelli, he classes together under the name of fungous tumours, speaking of them as a kind of fungus hæmatodes. By many other persons the term osteo-sarcoma is employed as synonymous with malignant disease; and yet there is no doubt that some of them are innocent in the defined sense in which you hear the term used in these lectures. Mr. Travers thinks that the greater number of the osteo-sarcomatous tumours of the bones are innocent, however intractable and incurable they may be; but I cannot quite agree with this opinion; for instance, if you examine either this or any other museum, the greater number of the preparations are of the malignant kinds, showing, I conceive, at once, that the innocent tumours are much more rare.

Probably if more were known of these tumours, many of them would be found to be analogous to several of the varieties of sarcomatous tumours of

the soft parts, modified by the texture of the bones, and especially by the mixture of ossific material in their composition, in consequence of their connection with the bones. To ascertain these varieties is not a mere minute distinction, but I am persuaded that it would be of practical importance to make out their distinctive characters clearly.

III.—1. The first genus I will call the *fibrous osteo-sarcomatous tumour*, by which I mean that it originates in the fibrous texture of the periosteum and substance of the bone, and is consequently like the fibrous tumour of fascia or cellular substance in its nature and character ; the main difference being, that although fibrous in texture like them, it is partly osseous also, from its peculiarity of origin. That these tumours arise from, and derive their nature from, the periosteum chiefly, is evident from these circumstances—1st, that you will meet with them entirely on the outside of a bone, without any apparent alteration in the cancelli ; and 2ndly, you never meet with such a structure well marked in the interior of a bone, without having some also, and generally to a greater extent, on the outside ; 3rdly, those fibrous osteo-sarcomatous tumours which arise first from the more loose membrane in the texture of the bone are less dense and fibrous than those which originate from the external periosteum, and have less bone in them than there is in the centre of the periosteal tumour ; 4thly, if the tumour arise within the original bone, its texture is not only less osseous and more granulated and soft, but as it spreads outwards to the periosteum it becomes more firm and fibrous than the interior part of the same tumour ; but if, 5thly, the fibrous osteo-sarcomatous tumour originate in the periosteum, and extend inwards, you may see it first in the form of a firm fibrous substance on the outside of the bone ; next, with ossification in its interior, and condensation of the outer part of the original bone ; and, finally, you may perceive the cancelli filled and obliterated with osseous matter, in a state of enostosis. Even in a very large tumour the outer tumour may in this way be found on maceration entirely detached from the bone, around which it grew in its periosteum ; or when the solid bone forms one indissoluble mass with the dense bone of the fibrous tumour affixed to it, yet sometimes a section of the whole still enables you to detect the line and direction of the outer part of the original bone. The obliteration of the cancelli, however, is not a necessary sequel of the formation of a fibrous tumour in the periosteum, since the diseased action may have so little affected the interior, that even in a large tumour you may find no new bone or tumour within, or perhaps only a narrow line across the cancelli, showing the incipient state of osseous deposit within.

a. In its most usual form, then, the tumour consists of *solid* bone in the centre of a mass of fibrous substance, the osseous growth being either external to the original bone or extending also into its interior ; and the periosteum of the bone gradually passes off into, or so as to cover and

surround, the fibrous structure, with which it is almost always inseparably joined. The fibrous structure is something like the fibrous cartilage of the vertebræ, or rather less dense, like a long-formed chronic node, but with a certain quantity of softer semi-fluid secretion mixed with the organized matter; and the bone is firm and dense, sometimes quite ivory in appearance, in one uniform central mass in the centre, or in various irregular masses, some of them separately formed; the whole forming a *solid* fibrous osteo-sarcomatous tumour.

b. In another case the tumour may be called the *radiated* fibrous osteo-sarcoma, the bone shooting out in a regularly radiated form from the surface of the original bone into the fibrous substance, or from the external part of a dense central nucleus formed on the outside of the original bone: both varieties are seen in these examples. This radiated form of the ossific matter is accidental, only, I believe: it is often seen in malignant tumours also, and, indeed, is sometimes spoken of as a proof of the malignant nature of a tumour. Mr. Crampton, for instance, in a paper on osteo-sarcoma, uses the term fibrous osteo-sarcoma as synonymous with malignant, from the radiated fibres of bone in the tumour. In the case thus related by him, of a tumour where new bone shot out like radii from the outer and inner surfaces of some of the bones of the cranium, so as to resemble hogs' bristles of three quarters of an inch in length, it is expressly mentioned that they were surrounded by *brain-like* substance. Now this it is that determines the character of a tumour, and not the fibrous and radiated direction of the bone, mixed with the soft substance. Here is a skull, in which the bone is radiated, I do not know its history, but, from the appearance of the bone, I conclude that this also had been a malignant disease. There is in the Museum of the College a curious example of this radiated form of bone (apparently fibrous osteo-sarcoma only, not malignant), in which bony radii half an inch long appear to grow from both surfaces of the frontal and parietal bones, covered and mixed with fibrous substance half an inch more in depth; when macerated, however, as a portion has been, it is seen that the original bone is perfectly sound, and the radiated bone on its outside and inner surface is quite loose, and must therefore have been formed in the pericranium and outer part of the dura mater.

If a fibrous osteo-sarcomatous tumour is macerated in acid, so as to deprive it of its osseous material, the distinctive character of a radiated appearance still remains; the solid form of tumour having a dense fibrous structure in its centre, where the bone had been hard and consolidated, and the radiated form still showing the animal matter of the same regular appearance; while others show the dense half-cartilaginous matter in the interior, with fibrous substance on the outside of a perfectly radiated figure—facts which demonstrate, as I conceive, that it is the mode in which the animal nidus is

formed that determines the figure and order in which the osseous substance is afterwards to be deposited within it.

c. A third form in which a fibrous osteo-sarcomatous tumour is seen, is that in which the structure is less dense and fibrous; portions are brittle and granular, with a certain quantity of fluid in cells mixed with the fibrous and granular structure. Mr. Crampton assigns this as the type in which all innocent osteo-sarcomatous tumours are formed; but I think it is not so common as the two other forms, and I believe it chiefly depends on the growth being dependent on the vessels of the bone itself, and not on the vessels of the periosteum—on its being more of an internal than an external formation; so that separate parts of the same tumour often exhibit both kinds of structure—the solid fibrous and semi-cartilaginous material, mixed with the looser granulated texture; and in an early stage, in the lower jaw, where this species is most common, the solid and radiated fibrous texture may distinctly be seen on the outer surface of the bone, and the granulated in the canelli; or in a very large tumour the granulated appearance may be seen in the interstices of the more solid fibrous mass, where, consequently, the structure is more like that of the canelli.

All three varieties of fibrous osteo-sarcoma are often found to contain cells of fluid, especially when they are growing rapidly; but the granular variety is most subject to them. In the solid fibrous kind the cell is usually single, and contains transparent yellowish or greenish serum; while in the granular kind the cells are sometimes exceedingly numerous, and of all sizes, and the fluid is commonly mucilaginous and glutinous rather than serous, and of every possible shade of brown or yellow colour, and of great variety of consistence. I do not know, however, that the fluid and cysts are at all essential to the character of disease, any more than in malignant tumours, in which these are frequently developed.

Fibrous osteo-sarcomatous tumours increase to an immense size. Observe this east of the femur, in which bone they are not uncommon. In St. Bartholomew's Hospital is a large tumour of the same bone, which was amputated near the hip by Mr. Ramsden, which measures three feet in circumference. There is in the College Museum a dry preparation of one of these tumours, which is figured in Cheselden's *Osteographia*, affecting the tibia and fibula, for which amputation was performed above the knee, the amputated member being said to have weighed 69 lbs. The most extraordinary case I know of, however, both for the size of the whole tumour, and the cyst it contained, is one described by Mr. Crampton as having occurred in the thigh-bone of a gentleman, at the age of 17, and having gone on increasing till his death, at the age of 38. Four years before his death the limb measured 3 feet 6 inches, and at the time of his death had reached the unprecedented bulk of 6 feet 6 inches in circumference. The

whole femur was converted into this tumour, except the head and lower extremity, the structure being of the granulated kind ; and in the interior was one immense cyst, containing several quarts of dark thick fluid. And yet this gentleman had enjoyed good health, and had walked on the affected limb till his death, which took place after only four days' illness, during which time he vomited an immense quantity of liquid, said to have exactly resembled that contained in the cyst, and by which he was in fact suffocated. Mr. Crampton gives this vomiting as a decided instance of metastasis ; but the cyst being full on its examination, and being some little distance from, and not related in any manner to the stomach, you may believe it to have been so, or not, as you please.

The structure of a fibrous osteo-sarcomatous tumour being, then, such as I have described, how are you to recognize it in the living person ? In truth, I know no positive distinction between one of these and any other solid tumour connected with a bone, especially where it is much covered by muscle or other substance. It is very like a medullary tumour ; but, if superficial, perhaps you may recognize in the latter a smoother and more regular outline, with less hard osseous tubercles than in the fibrous tumour. Again, it resembles fungus hæmatodes, which latter, however, generally has less regular hardness, with some parts, perhaps, of considerable softness and elasticity. Still all three are tumours of the same parts, and therefore must often be in many respects alike. The fibrous osteo-sarcomatous tumours are rather characterized by negative qualities than by positive : they do not often affect the health ; the skin does not usually become red, or otherwise much altered, over them ; the veins are not varicose in general, though this also is not a constant criterion ; and further, the non-malignant nature of these tumours is proved by the event ; for we have seen for how many years, and to what a great size they may grow, without any glands being enlarged, and without any change in the system, and without any morbid alteration of the parts around them. We may then, from all these facts, form a very probable conjecture as to the nature of an osteo-sarcomatous tumour of a bone, though I must confess there is no distinction to be confidently depended on till dissection has been made, nor, indeed, always can you even then feel quite certain ; but, in general, you can satisfy yourselves that there is no malignant deposit by a careful examination, especially of the outer part of the tumour.

They are also sometimes like the encysted tumours, before the bony parietes in the one case have yielded and softened, or before enough soft substance has been formed in the other to demonstrate the difference between them. Then, again, a soft tumour, bound down by a fascia to a bone, may sometimes be very difficult to distinguish from a tumour of the bone itself. The presence or absence of pain is no criterion of the nature of

a tumour, since all osseous tumours, whatever their nature, may sometimes grow slowly among unimportant parts, and give no pain when of large size, while others of small bulk may occasion much suffering from local circumstances, from pressure of nerves or muscles, and not from the qualities of the tumour itself.

Neither is the progress of the tumour locally always such as to afford an accurate diagnosis, for even an innocent fibrous osteo-sarcomatous tumour may, in a few instances, ulcerate and occasion great irritation, and may even sometimes shoot out a kind of fungous growth, with sloughing, and terminate fatally; and yet such a result may be caused by simple distension, or some other local state, or by the depraved condition of the general system, unconnected with the essential nature of the tumour. I dare say some of you have read an account of a case published by Mr. Abernethy, where a solid tumour of the upper jaw terminated, after sloughing and bleeding for several years, in the formation of an osseous cup, of large size, on the cheek. The nature of the tumour is not so stated as to enable one to decide whether this tumour were fibrous or hæmatoid, but it shows sloughing and bleeding for a long time in an osteo-sarcomatous tumour, not fatal fourteen years after this apparent evidence of malignancy; and that such a change had taken place in the action of the vessels of the mixed tumour, as to convert any after deposit into simple exostosis (probably ivory), instead of its having soft substance also in the structure.

Fibrous osteo-sarcomatous tumours less often become stationary than exostoses; but are they in themselves curable or remediable by medical and surgical treatment? This important question depends in great measure on their malignancy; and I have told you already, that I believe you will not find after death any contamination of the glands, nor any similar morbid deposit elsewhere, by affection of the whole system. If I could entertain any doubt on this point, it would be as to the softer, more brittle, and somewhat lardaceous texture, which constitutes the third species of the tumour, and is chiefly seen in the lower jaw; but that tumours of this structure should continue to grow for so many years, and to so vast a size, and that so many successful operations for them should be performed, without their contaminating any other texture, is hardly consistent, I think, with the supposition of the tumours possessing any malignant qualities.

It was probably to this very species that the immense tumour of the head belonged, the cast and drawings of which are behind me (and also the enormous tumour of the thigh, which Mr. Crampton has described), from the expression used by Sir Everard Home, of part of it consisting of fat mixed with steatomatous substance.

This was a case which certainly reflected the highest credit on Sir E. Home, for the boldness and success with which he grappled with the appalling

difficulties presented to him : and his patient is still a living monument of his skill and dexterity, whom some of you have very probably seen as a nurse in this hospital, without being aware that she was such an illustrious example of the triumphs of surgery. The tumour was connected, as you may perceive, with the right parietal and frontal bones, the diploë being partly affected, and had increased to three or four times the size of the head, and reached almost down to the clavicle, with a tolerably large base. It was occasioned by the kick of a horse when she was two years old, and was suffered most unaccountably to enlarge till she was 25 years old, when it was removed in this hospital in 1816 ; all the soft substance being taken away on the first day, and the osseous base being sawn through on the following day by this peculiarly-shaped saw, which was so made to pass between the tumour and the orbit horizontally. She was several years cook in Sir Everard's house, at Chelsea, before she came here as a nurse ; and the drawing was taken nine years after the operation, but it certainly is not a very flattering likeness, as in her cap you would not perceive a great deal wrong in her appearance. The internal table of the skull was perhaps in part affected, since she has been unequal to hard labour, from headache being occasioned by it.

In this case, then, of immense tumour, one table only of the affected bone was removed, and yet the operation has now been successful twenty-two years ; an amputation, therefore, of an extremity above a tumour, removing all the diseased mass, ought to be still more likely to save the patient ; and I think, in reality, there is abundant evidence of the non-malignant character of this kind of tumour, in the numerous successful operations, so that the patient may reasonably expect that the removal of the tumour will leave him safe from any return of disease ; and consequently that the term osteo-sarcoma is not to be employed on the supposition that all tumours deserving this name are necessarily malignant.

To stop the growth of a fibrous osteo-sarcomatous tumour, without the necessity for operation, would be an important object in many situations ; and I think it not impossible that you can sometimes do so, by the same means I before mentioned for cartilaginous exostoses, though I have not any dissection to prove the fact. A man was under my care, with a tumour on the trochanter and neck of the femur (in the same situation nearly as this exostosis), into which I passed a needle, and found it to be a firm fibrous mass, with the bone at the bottom of it, and about three-quarters of an inch in depth, below the healthy parts. There was no inflammation and no tenderness whatever, but the patient suffered such violent pain, of apparently a nervous kind, as quite to confine him to bed, and occasion much emaciation. He used the hydriodate of potassa, with mercurial ointment, so mild as not to affect him, and took about five grains of hydriodate of potassa, and three drops of tincture of iodine, internally, three times in the day, under which

treatment the tumour nearly went away, and he was able to leave his bed, thin and weak indeed, but free from pain; and I had the satisfaction of hearing that, two years after returning to his work, he continued free from his complaint. I cannot help thinking that this was a case of fibrous tumour of the bone, in which the deposit of osseous matter had scarcely commenced. A woman was more recently under my care in the hospital, with an immense tumour of the thigh, reaching from the condyles half-way up the bone; it was knobby and irregular, partly composed of firm bone, but in great measure of a softish kind of fibrous substance, of some thickness, covering the masses of osseous growth, and giving the tumour a more rounded outline. The veins of the thigh were much enlarged over it; she suffered intolerable pain, without tenderness or any interference with the motions of the knee-joint; she was sleepless and emaciated, and suffered greatly from the irritation of the tumour, which Mr. Keate, who saw the case as well as myself, concluded I must remove by high amputation, as soon as her health was in a little more favourable state. She took opium and sarsaparilla, and I applied some leeches and a blister to the tumour, and afterwards made her use the hydriodate of potassa ointment; under which treatment not only did her health improve by diminution of the pain, but the soft part also of the tumour disappeared, so that the size of the thigh was much diminished, and the veins returned to their natural appearance, and I could no longer think of amputating the limb. The ointment irritated the skin, so as to prevent its being long employed, and the pain and swelling began to return once, but again went away, and she left the hospital with her health much restored, and able to walk about, without much inconvenience from the irregular bony tumour that alone remained. This tumour may perhaps have been of the third species of fibrous osteo-sarcoma, though I fear it was malignant; still the case is encouraging in doubtful cases, or where the patient refuses to have the tumour removed, or it is in an inaccessible situation.

But certainly, however, in the greater number of cases, there is no sensible effect from either general remedies or local means, and a surgical operation is required for the removal of such tumours as are inconvenient from their bulk, and the deformity they occasion, or for those that excite such irritation of the system, by their rapid growth, or sloughing and ulceration, that the patient's life is endangered, if they are left untouched. Almost every part of the body may be the seat of these tumours, and most of the bones have been operated on by some person or other; some of these operations certainly requiring great skill, boldness, and anatomical knowledge, and great confidence on the part of the operator in himself, and in the courage of his patient. One great point is, always to distinguish these tumours very carefully from malignant diseases, if it is possible, so as to avoid an operation altogether, or be very guarded as to the promise of a cure from one.

a. In the head, for instance, Sir Everard Home's operation shows you what may be done in a case of fibrous osteo-sarcoma, but contrast this with many you will find on record, of fungous tumours of medullary and hæmatoid character; with a case, for instance, related by Sir Astley Cooper, in his Essay, where he sawed off a tumour of the cranium, the bleeding from which, with its loose spiculæ of bone, shewed its malignant character, and the irritation of which operation was followed by coma and a fatal result on the sixth day; dissection exhibiting the attachment of this tumour to the dura mater within the bone, the whole thickness of which was diseased.

In insulated situations, as in the bones of the extremities, the distinction is not quite of so much importance, since the whole tumour, whatever be its nature, is generally capable of being removed with a greater probability of all the affected part of the bone being taken away; or still more, by an amputation above the next joint. America can boast of some of the most formidable operations of tumours of the bones, especially by two surgeons whose characters vouch for the accuracy of their relations, and both of whom are partly English surgeons, as they received some of their education under Sir A. Cooper in this country.

b. One of these gentlemen, Dr. Warren, removed a tumour of the ninth rib from a man of 30 years of age, which was of six years' growth, which covered four ribs, and was seven inches in diameter. The tumour was cut off, and a director passed under the affected rib, so as to separate the diaphragm and pleura from it, and the diseased portion of the bone was then removed. The man recovered, but a short time only had elapsed, when the case was published, and the nature of the tumour is not specified. The same gentleman removed, in another case, three inches of the sixth rib, and a smaller portion of the seventh also, with a large mass of what is called thickened periosteum, but was more probably a fibrous tumour (or else the operation must be considered unjustifiable), and this patient also was well some time after the operation. Operations of this kind on the ribs are fortunately not often called for, nor will many surgeons be found with nerve and dexterity enough to perform them so successfully.

c. Another bone of very important connections, which has been removed for osteo-sarcomatous tumours, is the clavicle. The first case of this kind, of which we possess any details, was by Dr. Mott, and in a letter from that gentleman to Mr. Travers, recently published, the patient is said to have been quite well ten years after the operation. It may be doubted indeed whether the tumour, which is said to have been of the size of two fists, was not of the nature of fungus hæmatodes, rather than of the fibrous kind, as there was hæmorrhage from fungous granulations in the tumour, its substance was soft, so that the bone was destroyed and moveable in the centre, although hard elsewhere, and it was so copiously supplied with blood that forty

vessels required ligatures in the operation; the result in so unpromising a case is certainly very satisfactory. Dr. Warren also has performed the same operation for an osteo-sarcomatous tumour of this bone, of what nature is not stated, but the patient died from cold in the fourth week. I shall also have to mention in the next lecture the removal of the clavicle by Mr. Travers, and certainly if you read the account of the manner in which the subclavian and jugular veins, the carotid artery, and nervus vagus, are connected with these tumours, and consequently also the danger on the left side incurred by the vital part, the thoracic duct, you will see that the operation is no trifling one.

d. We have seen that fibrous osteo-sarcoma is not uncommon in the lower jaw, and the immense size that it may attain is shown by a horrid preparation in the Museum of the College, which looks as if it could scarcely have weighed less than fifteen pounds. Operations have very often been performed on this bone, and in general with success, and it is undoubtedly proper to be done early, on account of the inconvenience and deformity, independent of the danger arising from them. Sir A. Cooper describes a curious case, in which the tumour of this bone was allowed to be fatal by suffocation, from its pressing backwards upon the glottis. Here is a cast of a tumour of this kind of irregular figure removed at the articulation and at the chin. Portions of the bone may be removed at any part without much risk,—from the side,—or the anterior part,—or half the jaw,—or nearly the whole may be taken away; and it is singular to witness the little inconvenience or deformity resulting from the loss of a considerable piece, a new ligamentous substance of much firmness occupying the place of the bone.* When the chin is taken away there is a danger, which Dr. Warren met with, and I think Richerand also, which you would not at first anticipate from the separation of the attachment of the muscles of the tongue and os hyoides, viz., that the tongue is sometimes drawn back with such force as actually to close the glottis, unless it is laid hold of, and fixed to the integuments, to prevent suffocation from this action of the muscles.

e. What is called epulis is really a kind of osteo-sarcoma of the jaws, and is therefore not curable if the affected part of the bone is left. This is a tumour of the kind which I removed, with the portion of alveolus to which it was attached, an operation having been twice performed before without success, and you may understand its connection with the bone from this circumstance, that although only fibrous where it grew from the bone, it has nevertheless a central osseous nucleus, apart from the alveolus. I shall have occasion to speak of epulis again, and will only therefore observe that the

* A girl is now in the hospital from whom Mr. Hawkins (on the 20th December) removed the side of the jaw from the canine tooth to the angle nearly, and a person looking at her at present would not know that any of the bone had been lost.

peculiar appearance, resembling gum, whence it has its name, is only given to that part of this species of fibrous osteo-sarcoma, which raises and affects the gum, and is not possessed by the rest of the tumour.

f. I shall also speak hereafter of osteo-sarcoma of the upper jaw, but let me remind you of the case from which this preparation was taken, in which Sir Benjamin Brodie removed the whole of the upper jaw, for I hope the fibrous kind of tumour;—the external part of this is in every respect a common epulis, the central part is like the usual appearance of fibrous osteo-sarcoma of a bone, and an internal part projecting into the antrum derives its character from the mucous membrane, just as the outer part does from the gum, and is therefore to all appearance a fibrous polypus of the antrum, or other nasal cavity.

(Fibrous polypi, in general, are in fact closely attached to the periosteum, and a piece of bone is often drawn away with them, as in this preparation, but I shall not further allude to them at present.)

Osteo-sarcoma of the fibrous character is not very common in the upper jaw, the cancelli of this bone being much more disposed to the growth of medullary and fungus hæmatodes tumours. The bone was first removed, I believe, by Mr. Lizars, of Edinburgh, and M. Gensoul, of Lyons, in the same year, and it has since been very often excised, but in the greater number of instances very improperly, in consequence of the comparative infrequency of the innocent kind of growth.

g. In fibrous osteo-sarcoma of the bones of the extremities, it cannot be right, I conceive, except in some rare case, at the express desire of the patient, to attempt to excise the tumour from the bone to which it is attached, as the basis of periosteum and bone is seldom small and defined enough to expect a satisfactory result, and an amputation of the member must therefore be preferable; sometimes of the same bone, as amputation below the knee for a tumour of the lower part of the tibia or fibula; but more frequently above the next joint, above the knee for instance, enough bone being seldom left in a sound state for the operation below, or of the affected bone at the next joint, of the humerus for instance, at the shoulder-joint. As to a tumour of the thigh, leaving no room for amputation below the hip-joint, I confess I should think the patient better left to what fate the tumour may bring upon him, than have this very dangerous operation performed of amputation at the hip-joint; and how many years he may live with such a tumour in the enjoyment of life, is apparent from the case I related to you of Mr. Crampton's, of an enormous osteo-sarcoma of the femur.

LECTURE III.

III.—2. Cystic Osteo-sarcomatous Tumours: (A) Simple Cystic Tumour—(a) Cystic Tumour of the Periosteum; (b) Cystic Tumour of the Cancelli. (B) Pulsating or Aneurismal Cystic Tumour.—3. Cancer.—4. Fungous Tumours: (A) Melanosis. (B) Fungus Medullaris—(a) Solid and Osseous; (b) Soft and without Bone. (C) Fungus Hæmatodes—(a) Irregular Expansion in the Cancelli; (b) Of the Periosteum; (c) Distinct Tubercle in the Cancelli.

General Remarks on Fungous Tumours.—Fractures.—Medical Treatment.—Tying an Arterial Trunk.—Removal, or Amputation.—Degree of Malignancy in Bone.—Confined to the Osseous Tissue.—Recapitulation.

III.—2. The genus *cystic osteo-sarcomatous tumour*, which comes next on our list is a tumour, which contains not a single cyst, like the serous tumour, with a bony or cartilaginous or membranous case, but a great many cysts, with sufficient solid organic substance, forming the partitions of the cysts, to communicate a feeling of solidity to the tumour; and it comprehends two species, which we will call the *simple cystic tumour*, and the *pulsating or aneurismal cystic tumour*.

A. First of the simple cystic tumour.

a. You may see here a preparation containing a number of cysts, and forming a tumour about three inches in length and two broad, which is attached to one of the ribs; there are thin membranous partitions between these cells, which contain a semi-transparent gelatinous fluid of a white colour, half coagulated by the spirit, none of the cysts being much larger than a small nut. This tumour arose from a fall, which fractured the rib, the ends of which did not unite, but formed a kind of false joint, with which the tumour is connected by fibrous substance, and the tumour existed for many years, without occasioning any inconvenience.

Now I presume that this is a cystic tumour, originating in the periosteum, and of exactly the same character as the similar cystic tumour, which is met with in other parts of the body, unconnected with bone. There is, however, in the museum of the College of Surgeons, a preparation, the history of which does not appear to be known, in which a cystic tumour with similar membranous partitions has a portion of loose bone in most of the cysts, looking as if they were the result of a kind of secretion, such as I have also seen in the cysts of the ovary, the nature of the contents of cysts varying, perhaps, from some peculiar circumstances, of which possibly, the proximity to the bone may sometimes be one.

The cystic tumour of the bone would present itself, therefore, in the form of an elastic tumour, sometimes containing osseous substance of irregular shape, in which the existence of fluid may be more or less evident to the touch; it would appear, also, that its removal, together with the part of the bone to which it is attached, would be the right practice, if it is troublesome or increasing in size; but that it may sometimes be left for many years,

without ending in any local or general mischief, in which respect it resembles the cystic tumour of the breast or other texture.

b. We might expect to find in the loose cancelli of a bone, that cells would sometimes enlarge, as in the cellular membrane elsewhere, so as to constitute a cystic tumour of the interior of a bone; but is there really such a tumour of the bones? I confess I have some doubts of the point. Cells, indeed, often form in the bones; you may see them of large size occasionally in a state of atrophy when a bone has not been used, as with long-continued disease of a joint, the bone of the cancelli being in great measure absorbed, and the cavities, containing a mucilaginous or oily or half-serous fluid, being thus left to occupy the vacant space: so again, any tumour of the bone may, on a section, show several cavities containing half a drachm, or half a pint, or several quarts of liquid, as in a case I related in the last lecture, but such cysts are an accidental addition to the tumour, whether it be the fibrous tumour, or what is more frequent, the medullary or hæmatoid species, and the character of the tumour depends on the solid substance composing it, and not on the fluid. But there are sometimes cases in which no medullary or other morbid product can be perceived, and in which there are many cells containing blood or bloody serum, or sometimes transparent fluid, the bone being absorbed, and a covering of thin bone, or thickened or half-ossified periosteum being found around the cells. Are we then to consider these as cystic tumours of the cancelli, like the last species of the periosteum? I recommend your reading a very interesting account of a case of this kind, published by Mr. Travers, in the 21st vol. of the *Medico-Chirurgical Transactions*; the tumour having appeared in a boy 10 years of age, after an injury of the clavicle, about a year after which Mr. Travers removed the whole of the clavicle except the sternal end. The tumour was found to consist of numerous cells, covered by a dense fibrous covering, and having some portions of bone in the interior, the cells containing dark grumous blood, both fluid and coagulated. The boy recovered from the operation, and was well a year afterwards, with very good use of the arm. Mr. Travers believes that the cause of the tumour was an effusion of blood into the cancelli by the injury which was insufficient to break the bone, and that, being confined, the blood had excited irritation, which ended in the absorption of the osseous part and the growth of the fibrous texture of the bone.

I suspect, however, that most of the cases thus described are instances of fungous disease, in which the growth of cells is more rapid, and the proportion of solid matter less than usual. Sometimes such a tumour is found of the nature of that called the areolar cancer, by Cruveilhier, with numerous cells of transparent fluid; here, for instance, is a plate of such a tumour, where a surgeon attempted the removal of the tumour, and went on with

the operation till the exposure of the dura mater showed him what he was about. The wound healed, as it happened ; and when the patient died, almost all the bones of the face and head, were converted into this kind of disease. Here, again, is a humerus, which was amputated by Mr. Babington, at the shoulder-joint, for a large tumour, the interior of which consists of large cysts with dark grumous blood, a good deal of which has escaped, and the remainder has now lost its colour ; you may see the cancelli quite gone, so that the bone bends, and some of the blood is in the cancelli of the upper and lower ends of the bone which still remain. The patient died soon afterwards, and here is the clavicle of the same side, in which the cancelli are partly absorbed, and the bone somewhat larger, but without any blood having been yet effused. Cruveilhier has a plate of a tumour of the thigh-bone in exactly the same state ; and I believe that although almost entirely formed of cysts, the disease is of a malignant character, and of the fungus hæmatodes kind.

But whether all such cases are malignant, or some of them are cystic tumours of the cancelli of an innocent kind, like those of the periosteum, there can be no doubt that when we meet with a soft elastic tumour of a bone, feeling as if it consisted of cysts, or proved to be so by puncture with a grooved needle, it ought to be removed when increasing rapidly, as some of them do ; then let the dissection satisfy our minds whether there is any malignant matter in the interstices of the cysts ; or if we still feel doubt, let the event decide at least the degree of such malignancy.

B. The other species of cystic tumour of the bones is a pulsating, or rather aneurismal tumour, the pulsation not always being evident ; it is called, also, osteo-aneurism, by Breschet, who first collected some cases of the disease ; or you may find a still larger series of instances, supposed to be of this disease, in a probationary essay by Dr. Handyside.

One of the few good descriptions of the disease is that of a man whose leg was amputated by Dupuytren, above the knee, and whose case is narrated by Breschet. The upper part of the tibia was expanded into a thin shell of bone, with membranous inter-spaces, in which the pulsation had been felt, with numerous varicose veins emerging from holes in the tumour, and with all the smaller arteries going to it increased in size, though the popliteal arteries and veins were healthy. On a section being made, the tumour was found to contain numerous cysts or compartments, lined by a vascular membrane highly developed, some containing a gelatinous fluid, some a black half putrid liquid, others a mixture of extravasated injection of coagulated blood, in distinct layers, like the coagulum of an aneurism, derived from numerous vessels ramifying with open mouths upon the membrane lining the cyst. There is another case, published by Joseph and George Bell, of Edinburgh, of the same structure, but not pulsating ;

the tumour was of the femur and the thigh measured 39 inches in circumference ; the structure was of hard bone, with innumerable cysts within, lined by a membrane, and filled with arterial blood, of which one cell alone contained above a pint.

Now this kind of tumour is supposed to consist of a diseased condition of the capillary vessels, of the nature of the erectile tumours, or aneurism by anastomosis, the pulsation being occasioned by these vessels, or by the effused blood in the cells, and the disease is ultimately fatal by ulceration and hæmorrhage, and irritation. Breschet, in describing the disease, doubts if it commences in the vessels, or in the osseous structure, and supposes that it is a further stage of scrofulous enlargement which, of course, is nonsense, as a pathological history.

Such, then, being the view taken of these tumours, the practice has been sometimes in accordance with it, and the tying of the main artery has been recommended and practised. One case in the tibia is said to have been cured by Lallemand ; but so short a time had elapsed after the operation, that it is unsatisfactory as a proof of cure. Another, and one of the best examples, is that which I have already given of Dupuytren's, in which case he tied the femoral artery in 1819, and the tumour is said to have nearly gone away ; it returned, however, and grew to an immense size, though without pulsation, and was amputated in 1826, when its structure was found to have been such as I have related to you.

Now that such a kind of cystic tumour, containing blood, and sometimes pulsating, does really exist, there can be no doubt ; and I have therefore placed it before you as a separate species of osteo-sarcomatous tumour, in deference to the curious nature of the subject. But I cannot bring myself to believe that it is really an erectile tumour of the bones, like nævi or aneurism by anastomosis ; but I am inclined to believe that it is a form of fungus hæmatodes, singular and important, doubtless, but not a separate disease. Very many of the published cases are little different from this humerus with coagula of blood, amputated by Mr. Babington, though without pulsation, and without distinct membranous lining to the cavities. Many tumours of the bones, which pulsate most distinctly, so as to be easily mistaken for aneurisms are evidently of medullary and hæmatoid character, like the similar tumour of soft parts, and I have seen the artery tied for such tumours. An excellent case of this kind was published by Mr. Guthrie, which was believed by Sir A. Cooper and Mr. Thomas to be aneurismal, Mr. Keate and Mr. Guthrie having some little doubt of the nature of the tumour. The common iliac artery was tied, and the tumour for a time disappeared nearly, but was fatal in six months, and proved to be fungus medullaris of the innominatum. So also with regard to aneurismal cystic tumour in a case of Dupuytren's, related by Breschet, in which the limb was amputated, it is

expressly mentioned that the lateral ligaments of the knee-joint were partly scirrhous and partly carcinomatous ; and in many others, both of Breschet's and Handyside's cases, it is quite evident that there was the distinguishing structure of fungus medullaris and hæmatodes, in which there happened to be cysts formed, and some of them contained blood and bloody serum ; circumstances common in all malignant tumours. If, then, you meet in practice with elastic tumours of the bones, some of which pulsate, and which contain blood in cysts, you are, I think, to regard them as malignant, and instead of tying the artery, the influence of which at the best is but temporary, you ought if possible to remove the affected part ; although even this operation performed for tumours, exactly such as Breschet describes, is an uncertain one. For instance, one of the cases quoted both by Breschet and Handyside, is one related by Scarpa, in his work on Aneurism, who amputated the thigh of a young man for a pulsating tumour of the tibia, produced seven years previously by a blow from the horn of an ox. The tumour contained blood coagulated in cavities, mixed with fragments of bone in a structure like the spleen, the original structure being destroyed by what almost every one in this country would call fungus hæmatodes. After five years of good health, pain in the stump prevented his wearing his wooden leg, and the stump enlarged into what is called by Scarpa a large aneurismal pouch, which pulsated and crepitated on being handled, and extended even behind the loins ; and which was found to be a large bag, of which the periosteum formed the sac, and which reached up to the trochanters.

Still more let me advise you not to meddle with such tumours in the same bone, near the tumour itself ; for you may meet with the most alarming and fatal hæmorrhage, and the disease is sure to return, from the extent to which the cancelli are affected. Mr Liston has published the case of a boy with a tumour of the scapula of this aneurismal cystic kind, though not pulsating ; in which he attempted the removal of the diseased portion of the bone, but, accidentally cutting into a large cyst, there came out an immense gush of arterial blood, mixed with large coagula, as if an aneurism were opened ; and the boy dropped down nearly lifeless. Mr. Liston, however, rapidly cut the tumour open, and felt the stream of blood so as to stop it, and then cut off the tumour, tying all the large vessels which supplied it. The cicatrix soon became a bleeding tumour, with hæmorrhage from time to time, which carried off the boy ; the removal of the remaining portion of the scapula and part of the clavicle being proposed by Mr. Liston, but not acceded to by other surgeons ; and on examination, all the remaining cancelli of the bone were found in the same diseased cystic and hæmorrhagic state as in the part which had been removed by the operation.

Such, then, would probably be the usual result of such an operation for the removal of the tumour by a section of the same bone, whether it be of an

erectile nature, as Bresehet supposes, or a modification of fungus hæmatodes, as I believe it to be.

We now come to the consideration of the acknowledged malignant diseases of the bones, which are the same as those of the soft parts—viz. cancer and fungous diseases. Both of these genera may either originate in the bones or may spread to them by contiguity, as when a cancerous ulcer of the breast affects the sternum or ribs ; but the fungous diseases less frequently extend to the bones from the neighbouring textures. There is a great difference between the two genera in this respect: that fungus hæmatodes and medullaris often appear in one or more bones, while no other organ or texture of the body affords evidence of the contamination of the whole system—but cancer has never been observed, I believe, by any one to affect the osseous textures primarily ; it has always made its appearance in some other organ, as the breast or uterus, before it has been noticed in the bones : such, at least, is the concurrent testimony of not less extensive experience than that of Sir Astley Cooper, Sir Benjamin Brodie, and Mr. Travers.

III.—3. Cancer is shown in the bones by a softening of their texture and absorption of the phosphate of lime, and the formation of somewhat larger cells than natural, in which there is a bloody, pulpy, or semi-fluid substance ; in which state they are soft enough to be cut by the knife. At a later period, generally the bone is found to have the peculiar gristly appearance of scirrhus by deposition of cancerous matter in the cancelli. A woman was under my care for cancer of both breasts, with scirrhus tubercles in the skin, who complained for some months of pain in the cervical vertebræ and inability to use the muscles of the neck ; and in several of the vertebræ I found the pulpy alteration I have described. In Sir B. Brodie's work on the Joints and Spine, you will find the case of a lady who had scirrhus of the breast, and who was seized with sudden paralysis and loss of sensation as high as the navel ; and on her death, two months afterwards, several of the dorsal vertebræ were found in the soft state and gristly condition, without phosphate of lime, which mark the more advanced stage of the change. There is a woman in the hospital at present, partly under my care, who had her breast removed six years ago, and in whom some scirrhus tubercles and enlarged axillary glands have made their appearance within the last year ; who has for several months lost the sensation of the lower part of the body, and all power over the lower limbs and abdomen and the rectum and bladder, with alkaline urine, and such violent pain along the spine and in all the paralyzed muscles, which are almost always contracted with force, that her sufferings are very great ; and in whom I am inclined to believe there is a similar scirrhus change, unless her symptoms arise from some disorganization, possibly a scirrhus tumour in the membranes of the spinal marrow itself. The cancerous disease is most frequently observed, however, in the

cervix femoris, and the softness produced by the disease makes the bone bend or break from slight causes, just as it does from the simple atrophy of old age, which has been before described to you. Several cases of this kind have been published in the "Medico-Chirurgical Transactions" and elsewhere, and they are often seen with deep-seated pains, like those of rheumatism. Here are some preparations from a woman who died in the hospital with hæmoptysis, arising from cancer of the lungs and bronchial glands, and who had also cancer of the kidney and the other renal capsule, and of the uterus. She had suffered for a month before her death from pain in the hip, though no fracture was perceived. You may see, however, a considerable cavity in the bone by the absorption of the cancelli, in which cavity fluid existed, with pulpy substance and scirrhus matter in the head and lower end of the bone. Here is another fractured cervix femoris, from a patient of Sir Benjamin Brodie's, who had had her breast removed for cancer, but the disease reappeared some months afterwards in the cicatrix, and then pain of a very severe character took place in her hip and knee, increased by pressure; and before or after death the bone gave way, in consequence of its softened condition. Sir Benjamin Brodie once saw the clavicle break, from the patient turning in bed, with the same disease.

It seems, then, that the changes are very like those of mollities ossium, softening and formation of bloody cells, with flexibility and frangibility of the bones, and severe deep-seated pains, and occasionally a deposit of soft substance like scirrhus is described. May not some of the supposed cases of mollities ossium, which are very imperfectly described in general, have been in reality cases of cancer of the bone? This is a question that has sometimes suggested itself to me from the description of the cases; but I have never seen such a disease, and cannot, therefore, pretend to determine it.

Cancer generally evinces itself in the way that I have described in the cancellous structure, and seldom affects the periosteum so as to appear in the form of a tumour: sometimes, however, scirrhus tubercles are formed externally in the periosteum, although it is then also usually by absorption of the shell of the bone allowing the disease to proceed externally from the cancellated structure. Mr. Salter, in a description of a case of fractured neck of the thigh-bone from cancer, remarks that the muscles around the bone were consolidated into a cartilaginous mass, with bony spiculæ within it, so as to form an external tumour; an account which looks as if the morbid action had extended from the bone to the muscles.

When a cancerous tumour extends its ravages by contiguity to a bone, the bone ulcerates, and granulates, and bleeds, and shoots out a fungous growth of the same character as cancer of the soft parts. Here, for instance, is a preparation from a patient of mine, with cancer of the skin of the face, which affected the bones of the cheek, and made an opening through the

bottom of the orbit leading through the dura mater into a large abscess of the brain.

Where the surface of a bone is thus affected, it may be right to remove as much of it as can be done. I should have performed such an operation not long ago, for a large cancerous tumour of the skin of the chest, affecting the sternum by contiguity, and not yet injuring the health, had not the man got frightened at the proposition of any operation being undertaken. Of course, if cancer only appears secondarily in the bones, there cannot be any prospect of cure from anything that can be done medically or surgically; nor do such cases present opportunities for operation. When a bone is fractured from cancer, it sometimes unites sufficiently for the patient to walk about with a stick, but he is not sufficiently healthy for more than soft union being produced, and it is not often that even this has been observed.

III.—4. The fourth genus, or *fungous disease* of the bone, is nearly like that of the soft parts, and consist of the same three species—the *medullary tumour*, or *fungus hæmatodes*, or *melanosis*. These are much more frequently observed than cancer, and differ from that disease in sometimes forming very large tumours, and in often occurring, as I before remarked, in the bones first, or while no disease can be observed elsewhere. The tumours of this genus sometimes present either species in a well-marked form; sometimes they are intermixed in the same tumour, but the exact character can often scarcely be made out without dissection, though the tumour under examination may evidently belong to this genus of fungous tumours. They occur in persons of all ages, in the bones as well as elsewhere. Sometimes fungus hæmatodes is seen in quite a young child, especially in the face; more frequently both fungus hæmatodes and medullaris are met with from the age of twelve to thirty; after which the medullary tumour and melanosis are more frequently seen than the other species. Mr. Travers has observed that fungous tumours are most common in the flat bones; but certainly I have myself seen them just as often in the long bones, as the femur and tibia. All the three species occur in all the structures of the bone, the periosteum, the cancelli, or the outer shell.

4.—A. Here is a preparation of *melanosis*, which is much the most rare, and I have only myself seen it, like cancer, after some other part has been attacked by the disease, though I do not assert that it does not occur primarily in the bones. When melanosis does take place, it differs from the two other species in being almost always in spots or small tubercles in the cancelli; it is occasionally seen, however, in globular masses on the outside of the bone, as in a plate of Lobstein's work. Very often it is mixed with the other forms of fungous disease. For these several reasons I shall take no separate notice of it further than these observations.

4.—B. *Medullary* or *encephaloid* tumour is very frequent, and presents a

great variety of appearance, from a soft white diffuent mass, like brain, or with a few cells of gelatinous fluid, and containing only a few spiculæ of osseous substance, to a mass of solid bone, with hardly any medullary matter.

B.—*a*. Here is a good example of the solid form, which occurred in the tibia of a boy, 14 years of age, which was amputated in this hospital, at which time the knee-joint was fourteen inches in circumference, tense and shining, and with tortuous veins on its surface. Some parts were hard, others soft and yielding to pressure, and the joint was unaffected, and kept usually half bent. The section shows you the exterior of the tumour, with some cysts of fluid, and a thin stratum of white medullary matter, the epiphysis and cartilage being quite sound, and the centre of the tumour of solid bone below, partly in the cancelli, and partly on the outer surface of the shaft, chiefly in a radiated form. In this case pain occurred in the bone in April 1831; a tumour appeared in six weeks' time, and it was amputated in the following September by Sir Benjamin Brodie, and the boy died in the ensuing spring with fungus medullaris and hæmatodes in the lungs. Here, again, are several sections of another tumour of the thigh-bone in a boy of about the same age, a patient of Mr. Babington's, which is, you observe, close to the knee-joint, and equally solid with the last, with a thin layer of medullary substance, but no cysts. This boy died in consequence of inflammation of the veins after a puncture with the lancet, and there was no disease apparent elsewhere, so that the amputation, which we proposed, might have been successful.

I well recollect that, in external feeling and appearance, there was no one circumstance that could enable one to distinguish these tumours from a fibrous osteo-sarcomatous tumour, previous to dissection, though the youth of the patients made their malignancy very probable.

B.—*b*. Here, on the other hand, is a medullary tumour of a very soft kind, in the thigh-bone of a young woman, under my care, in the present year, which measured eighteen inches in circumference, and extended over so large a portion of the bone, that I was obliged to amputate it very high, in order to get above the diseased parts. It entirely surrounds the femur, from the condyles upwards, and originates in the periosteum, the shaft of the bone preserving quite its natural appearance, and the cancelli, on a recent examination, appearing perfectly healthy, scarcely even more vascular than usual. Yet, although periosteal, this medullary tumour is not firmer than brain; it has no bony spiculæ whatever in it, and the only formation of new bone is a small solid portion closely attached to the back of the femur, and about a third of an inch thick; and this new bone is seen exposed, by the section having opened a large cavity, containing several ounces of sanguineous serum; and there are some smaller cells elsewhere, and one or two points of the medullary substance are red and bloody. The malignant nature of the

disease is evinced by the neighbouring muscles and fascia being implicated, so as to form a part of the diseased structure, and by some separate medullary tubercles being found in the vasti muscles, with intervening healthy substance. This tumour had been growing for about eighteen months, and its feeling and mode of growth, and the appearance of the patient, showed that it was most probably medullary. She died soon after the operation, with suppuration in the cancelli of the upper part of the bone, and inflammation of the small veins; and, on examination, I found several tubercles of a medullary nature in the lungs.

Now this medullary tumour of the bone was so large and soft, that it might easily be taken for a tumour of the soft parts, only adherent to the bone. On the other hand, a tumour of the soft textures, bound down to a bone by fascia, even if not adherent, may give precisely the appearance of being a tumour of the bone itself; for instance, a young man fell under Mr. Travers's observation whose arm was amputated at the shoulder-joint for what was supposed to be a medullary tumour of the humerus, but which was only situated among the muscles; the disease returned in the axilla and side of the chest.

This preparation is a portion of a tumour, quite soft and without any bone, which was removed from the cranium by Mr. Ewbank, when I was house-surgeon of this hospital; but he was less fortunate than Sir Everard Home, as the disease returned in a few months, and spread through the bone to the dura mater, and terminated fatally. Here, again, is a small portion of a very large tumour of the same kind in the head, which was four times operated on, but was ultimately fatal.

Now these cases, and an examination of the morbid specimens before you, are quite sufficient to demonstrate the origin of medullary tumour sometimes from the periosteum, which occurrence is denied by some pathologists; and some of them show you also that solid bone may be deposited in the cancelli and interior of the tumour, by what may be termed a healthy action of the periosteum and membrane of the cancelli, unmixed with morbid deposits of fungous structure. Nor is this observed only in the harder long bones; for instance, I recently met with a case described by Mr. Travers, in which there was a medullary tumour on both sides of a rib, in a child, the outer of which had been punctured as an abscess, without any communication between the two tumours, though the bone being partially absorbed, they would probably soon have formed one tumour; and I have repeatedly seen this circumstance with regard to the cranial bones.

At the same time medullary substance is often formed in the cancellated structure first, and subsequently makes its way by absorption through the bone, and suddenly increases or produces symptoms. An instance in point was published not long since by Dr. Malden, of a man who was a month

under the care of the surgeon in the Worcester Infirmary, for inflamed eye, without suspicion of other disease; then he was suddenly seized with stupor and paralysis of the side opposite to the inflamed eye, and died in five days; and on examination a white tubercle, of the size of a walnut (medullary, I presume, from the description), was found in the *diplœ*, the bone being absorbed on both sides, so that the tumour was in contact with the eye and with the *dura mater*, and communicated with an abscess holding three ounces of pus, in the anterior lobe.

If a medullary tumour be left to itself, it becomes a source of great irritation, sometimes from ulceration and sloughing and hæmorrhage, by which the patient may be carried off, or from the effects of which he may rally for a time. To show such a course, let me describe a case which came under my care in the hospital. A man, twelve months before I saw him, felt some pain and stiffness about the knee, aggravated by warmth, and soon afterwards a swelling appeared above the joint. Six months afterwards the kick of a horse made the tumour increase more rapidly, and aggravated his pain, though he still continued to ride as a groom. Now he became emaciated, sallow, and restless, and a part of the tumour inside grew very quickly, and softened and threatened to ulcerate, and gave such pain that, at his urgent request, I punctured it, and let out some serum, with brain-like substance mixed with it, and the probe could pass in all directions through the tumour, touching some loose *spiculæ* of bone, and striking the solid shaft in the centre. Amputation was refused, and though relieved from some of the pain, the tumour sloughed in a fœtid manner, the inguinal glands enlarged, he became jaundiced, and I was obliged in my turn to refuse amputation, which we all considered too late; and he left the hospital to die at home, as he thought, in order that his body might not be examined. I continued to see him, however, and he went on with some calomel and opium, and sarsaparilla, which I had previously given him; and in a few days the whole inner half of the tumour sloughed out, so as to form a foul cavity in the ham, in which the fist might be buried; then the wound granulated and contracted and filled up, and he became quite fat, and able to walk about. Six months afterwards, however, the outer part of the tumour began to enlarge and soften, and he again became sallow, and emaciated; and I conclude the disease must have been fatal (though I here lost sight of him), probably with a return of sloughing and bleeding and irritation, till the system sunk under it. Such at least is the usual termination of a medullary tumour of the bones, or any other texture; and the rapidity of the growth of the tumour, and the probability of return of the disease, seems to be in proportion to the quantity of medullary substance, and the absence of ossific deposit.

4. C. The hæmatoid species of fungous diseases presents itself under several different forms.

C.—*a*. In the most usual form there is an expansion of the periosteum and shell of the bone, which latter is somewhat softer and thinner than natural; and the interior consists of broken portions of bone, lessened generally in quantity; or there are only small spiculæ of osseous substance scattered here and there in a soft vascular reddish mass; or such spiculæ are mixed with a yellowish substance in the interstices, or with cysts of serum or of blood. You will see this structure in these preparations of the tibia of a patient whose limb was removed by Sir Benjamin Brodie, in the Asylum for Recovery of Health, while I was surgeon to that institution. The disease had given little pain or inconvenience, so that she was walking about at the period of the operation. The bone is in pretty hard masses, in a very vascular structure, with several cavities in the tumour. On her death there was found this cyst of very dark liquid in the ovary, which I preserved, but no other disease. Here, again, are the same appearances in a more advanced stage, in the interior of the femur, the osseous part of which is nearly gone, and the cartilage was much expanded over it in the knee-joint. It was amputated by Sir Benjamin Brodie, in a gentleman, 25 years of age, and is described in his work on the Joints. If you contrast these specimens with the medullary tumours, you will not fail to perceive how much they differ from one another.

These tumours often occur in the cancelli of the ends of the long bones, and thus appear like some obscure diseases of the joint, causing some pain and stiffness before any swelling is distinctly observed; which swelling is obviously not that of any disease of the synovial membrane, and has not the symptoms of ulcerated cartilage, which are the usual diseases of the joint. Even when swelling appears, and soft substance is generated, it grows both in the medullary and hæmatoid varieties, in the directions in which there is least resistance, so as to present a misshapen mass of morbid elastic substance, the exact origin of which you may have difficulty in distinguishing. Here, for instance, is a large tumour of the knee-joint, which I amputated, with a bleeding sloughy fungus in the front, over the patella, which had every appearance of being fungus hæmatodes of the femur, but which, on examination, seemed to originate in the ligament of the patella, a very small portion of which bone was affected. Sometimes, however, a tumour shows itself distinctly to belong to one or other of the bones of the joint, especially when its texture is in a considerable degree osseous, and the occurrence of such a hard bony tumour, becoming partially elastic as it softens, after pain about a joint, renders the diagnosis of the disease easy, except in the deeper joints. I have seen more than one case of obscure pain

about the hip-joint, with some impediment to its motion, and suffering of the system at large, lasting many months before it could be determined what was the actual cause of the symptoms, which has at last become apparent by the formation of a tumour round the joint. This large preparation was taken from a young man who died in the hospital, when about 23 years old, who had felt eleven months previously a sudden snap in the groin, as if he had sprained the joint, succeeded by lameness and pain, and in three months' time a tumour showed itself in the groin, which was exceedingly painful, and spread by degrees round the hip under the glutei muscles; then several openings formed by ulceration, which bled from time to time, and thus carried off the patient. The joint itself, as you may see, is perfect, but the innominatum is broken up into a great number of pieces, in a quantity of vascular substances like a sponge, from which the hæmorrhage had proceeded.

As the bone is thus broken up and softened, and mixed with fluid, in fungus hæmatodes, it is no wonder that the tumour should resemble an abscess. A middle-aged woman was admitted into the hospital with a large soft tumour on the right side of the chest, which fluctuated, and gave a considerable impulse on coughing, as if it had been a case of empyema making its way externally; when opened, fluid and pulpy matter, much softened by inflammation, came away, and portions of bone were felt in it; and when she died, it was found that there were three ribs destroyed for several inches, and converted into the tumour, and inflammation of the pleura produced by it destroyed the patient. The head of the humerus is another part which is not unfrequently softened by the disease, so as to convey a sensation of fluid. Here are some preparations from a woman who was admitted with some tumour of the breast under Mr. Rose, and with apparently an abscess on the parietal bone, which was punctured, but which proved to be a soft fungus hæmatodes tumour of the bone, through which the probe would pass to the dura mater, the outer surface of which, where in contact with the tumour, has begun to be disorganised, and to generate a fungus of a radiated character, and of soft fibrous substance.

Fungus hæmatodes is not infrequent in the diplœ of the skull, as in these preparations, and you may find many cases of this disease in a paper of M. Louis's, in the 5th vol. of the valuable Memoirs of the French Academy of Surgery, under the title of "Fungous Tumours of the Dura Mater;" in reality, however, such cases are diseases of the bone, affecting both tables, and so spreading to the periosteum and dura mater, but originating in the diplœ, and the disease thus makes its way towards the surface occasionally in several parts of the head at once. Mr. Stanley has been engaged for some time, I believe, in investigating the disorganisations of the bones, and I look forward to the result as likely to throw light on the subject of their tumours: he was

showing me, however, a preparation in the museum of St. Bartholomew's a few months ago, as an example of fungous tumour of the dura mater, of which I ventured to express doubts, believing it to be a very rare occurrence, and on examining the part, I believe he was satisfied with me that the dura mater, although attached to the tumour, and thus made to project inwards, was itself perfectly healthy in structure, and that the disease had originated in the bone. Sometimes again, though rarely, a malignant disease affects both surfaces of the bone, before spreading inwards to the *diplœ*; but a fungous growth from the dura mater affecting the bone secondarily, and thus coming to the surface, I believe to be still more uncommon. M. Louis gives you plenty of proof, however, of the folly of meddling with malignant diseases of this kind when thus attacking the cranium, in the frequent occurrence of the patient's death a few days, or even a few hours after an injudicious puncture or other operation upon the tumour. The most extensive deposit of morbid matter sometimes takes place within the *diplœ* before the tables rise into the form of a tumour. In the museum of King's College is a very beautiful preparation of the cranium, made by a foreign physician, in order to show (what was his opinion) that the malignant disease was propagated along the veins. It is from a patient whose arm was amputated in the Middlesex Hospital by Mr. Arnott, for fungus hæmatodes of the humerus, which returned in many of the bones, and, amongst the rest, the cranium had several tumours in it. Now it is evident, I think, that although the canals for veins are large, like all the vessels of a tumour, yet the deposit has taken place not in the canals, which are smooth, and the bone natural, but among the capillary-vessels generally, the bone being eaten away wherever the morbid deposit had been lodged in the *diplœ*; in short, the deposit was produced in the ordinary way of all morbid growths, by the capillaries of the membrane of the *diplœ*. Let me remind you of this singular preparation on the table, which I described to you when speaking of absorption and inflammation of the bones, in which an appearance of several pulsating tumours of the cranium was occasioned in a patient of Mr. Keate's by spontaneous hernia celebri, with inflammation of the bone, which tumours looked very like fungus hæmatodes.

Another situation in which fungus hæmatodes frequently appears is in the upper jaw, and other bones of the face and nose, with the same softening and expansion of the cancelli which I have described to you; but I shall speak of this subject in a future part of the course, with the other diseases of the antrum.

C.—*b*. Fungus hæmatodes is, secondly, developed in the periosteum of a bone, but the disease does not nearly so often commence in this texture as it does in the cancelli, nor is it so often met with as fungus medullaris of the periosteum. The external feeling of the tumours, thus originating, is like

that of a fibrous osteo-sarcoma, or a medullary osteo-sarcoma, but it is seldom so solid and firm, or osseous, as either of these forms, as it has little fibrous organized matter, and very little bone, either solid or radiated, in its composition. It is usually of a dark spongy character, something like a hardened spleen which has been macerated for some time—an appearance you can see very well in this tumour of the rib, which, being situated under the breast of a female, is said to have been very like a tumour of that gland, and the tumour itself in great measure subsided under the use of iodine for a short time. This fungus hæmatodes tumour of the external part of a bone is soft enough in general to resemble an abscess, but wants the sense of fluctuation on a careful examination, and has a greater degree of elasticity than an abscess commonly presents. Such a tumour is occasionally slow in its influence on the texture of the bone on which it is placed, but affects it more quickly on the whole than a medullary tumour does.

C.—*c.* Fungus hæmatodes is occasionally seen in the third form of a regularly circumscribed tubercle in the cancellated texture of a bone. Sometimes it is a circular dark mass like recently coagulated blood, or a portion of recently cut spleen, such as you can here see in a small round tumour of the lower jaw, expanding the shell of bone, and forming a prominence below the alveolar process. You may see the circular form in this tubercle of the thigh-bone, consisting of a yellowish substance with effused blood within it, which looked, before immersion in spirit, exactly like the large soft malignant tubercle of the liver. It is from a man, who was admitted into the hospital under Mr. Keate's care, for a fractured thigh, but who died suddenly a few days afterwards in consequence of hæmorrhage from the chest. The fracture is, as you may perceive, across the centre of the tubercle, which has just begun to soften and enlarge the shell of the femur, and the fatal hæmorrhage had taken place from these large fungus hæmatodes tumours of the œsophagus and root of the lungs and bronchial glands, and you may see the large ulcerated cavity of the œsophagus, whence the bleeding had taken place.

Fractures of the bones, when affected by either of the forms of malignant fungous tumour, frequently take place, sometimes by accidental violence, at other times spontaneously, the bone being found after a time to bend, when sufficiently disorganized, without the patient being previously aware that the limb was useless. In this patient of Mr. Keate's the fracture had taken place before there was much appearance of enlargement: but it is generally some time after the growth of a perceptible tumour before it thus softens or breaks.

It seems probable, when the growth of a fungous tumour is thus confined in the interior of a bone, that it may generally occasion more pain by the tension of the covering than in an external periosteal tumour; a woman, for

instance, was for a long time before I saw her an out-patient of the hospital for some disease of the knee-joint, to which leeches and blisters and other remedies were applied, and I was afterwards asked to see her at her own house, when I found her suffering intolerable pain from a large tumour, evidently of malignant character, in the lower third of the thigh-bone. She one day heard and felt a snap or giving way of the bone, after which the limb became quite flexible, but her pain was much lessened directly; this took place, however, only a few days before her death. When thus confined by the shell of the bone, there are two other effects perceptible during the growth of a malignant tumour; first, the expansion of the shell is a slow process, and the tumour increases slowly for a time, but at last it reaches the periosteum, which offers less resistance, so that a rapid increase of bulk is sometimes immediately perceptible, and the structure directly becomes less osseous, and more like the same disease of the soft parts;—secondly, when thus compressed, the morbid substance is more easily developed in the cancelli than in the shaft, and consequently when an amputation is performed apparently at some distance above the tumour, the interior of the bone, where it seems sound on the outside, may be quite filled with medullary or hæmatoid substance. The disease may therefore return in the stump after an amputation has been supposed erroneously to have removed the whole of the morbid growth; and hence it is safer, if practicable, to remove the whole of an affected bone, than to saw across it;—to amputate at the shoulders when there is apparently room below; or above the knee, in preference to below it, unless the space above the disease should be very considerable, by the tumour being quite at the ankle, in which case the greater danger of an amputation of the thigh is to be taken into the account; for which reason, also, an amputation at the hip-joint would always be less prudent than an amputation below, cutting across the diseased bone at what seems to be a sound part. The medullary form of disease is especially liable to be thus diffused in the cancellated structure, but it is found also in the hæmatoid forms of tumour; especially when there are cysts and cavities; and particularly with regard to the hæmorrhagic disposition of the vessels, which prevails sometimes to a greater distance than any morbid material can be detected, and this, whether the vascularity be such as to give the tumour an aneurismal pulsation or not.

I dare say I might subdivide the fungous diseases of the bones into a greater number of varieties, but I do not know that any of them essentially differ from what I have described, or from the progress of the corresponding fungous tumours of the soft textures. I need not say there is no more curative power in medicine for these tumours than for the same diseases elsewhere; but we have seen from a case related to you that a temporary amendment of the constitution can be effected, and the fatal event retarded

by sarsaparilla and oxymuriatic, or calomel and opium in small doses, with tonics. I mentioned another in which all the soft parts of a tumour, probably fungous, disappeared under friction with hydriodate of potassa with mercurial ointment; and I have shown you this preparation of the rib in which the tumour materially diminished for a time: but such retardation of the fatal event, and palliation of the symptoms produced by the tumour, is the utmost that can be anticipated.

A more ample trial has been made in cases of fungous tumours of the bones than in those of soft parts, of the effect of intercepting the main supply of blood passing to the tumour by the ligature of the principal arterial trunk; and this operation has been done sometimes by mistake, the disease having been supposed to be aneurism, sometimes on purpose, and it has been generally unfortunate in its results.

Sir Astley Cooper, in his Essay which I have recommended to your perusal, describes two cases in which the operation was intentionally performed, when the amputation of the diseased part was refused; one of them was by himself, the humeral artery being tied for a tumour of the radius, which at first sloughed, but soon began to grow again; the other was the ligature of the femoral artery, by Mr. Lucas, for a tumour of the tibia, which did not diminish at all, and the operation was succeeded by mortification, requiring the amputation of the thigh a week after the first operation. Of the cases in which an artery has been tied by mistake, I may mention to you one case of Pelletan's, believed to be aneurism, but really a fungous tumour of the humerus, in which that surgeon tied the subclavian artery, and then opened the tumour, and the patient died in two hours; and another of a tumour of the same bone, in which the subclavian artery was tied by Dr. Nicoll, but the patient died of hæmorrhage from the vessel. I have also already mentioned to you Mr. Guthrie's case, in which the result was somewhat more fortunate, as it lessened the tumour of the innominatum for some months, and placed the patient in comparative comfort, and retarded the fatal event for that time. If, therefore, a tumour is not capable of removal from its situation, or size, or connections, or the patient refuses the extirpation of the tumour, when the safer operation might be performed, and is in tolerable health at the time, the ligature of the chief artery going to a tumour may fairly be placed among the plans of surgical treatment, which are justifiable; taking into account, and plainly laying before the patient the risks of mortification and hæmorrhage, so that the adoption of a desperate remedy in a desperate case, is his own free choice, rather than our persuasion.

But if the removal of the tumour is practicable and consented to, certainly that is the course to be recommended; it is uncertain, indeed, in the result, for I have incidentally mentioned, already, seven or eight cases in which the

disease, being a constitutional one, returned in some other part of the body, especially in the lungs, and I could describe many others, if it were necessary. Still it is the common opinion, that fungous disease is less likely to return, after it has first appeared in a bone, than it is when situated in the soft parts, such as the breast or testis; and I am inclined to think that this opinion is probably correct; and there are a sufficient number of successful cases to justify an operation almost in every case of fungous disease of bone. You may see here a very remarkable specimen of the hæmatoid variety in the fibula, the tumour being several inches in diameter, and occupying nearly the whole length of the bone, while it is excessively vascular, with large vessels and cellular membrane hanging in shreds within it; yet this was removed by amputation in a young lady by Sir Benjamin Brodie, and several years elapsed at least, during which there was no return of the disease in any other part. In the case also of this medullary tumour of the femur, which is described by Sir Benjamin Brodie in the work on the Joints, four years at least had passed, and all was still right, although the affected bone itself was divided by the operation. I have already alluded to Dr. Mott's celebrated case of excision of the clavicle, as being probably of the hæmatoid kind, and in which twelve years had safely elapsed. There was a remarkable case in the London Hospital, which reflects great credit on Mr. Luke, for its treatment, in which the scapula (a bone the loose cancellated structure of which makes the malignant deposit very liable to spread) was the seat of a tumour growing rapidly in a girl of 14, and which, when punctured, proved to be *brain-like*, with osseous particles. Three quarters of the scapula were removed with the tumour, which grew from the periosteum on both sides, while the bone was healthy in the centre, and the patient was well a year after, with such good use of the arm that she was said to nurse a child as well as before the operation on that side, so that at all events, if the case ends fatally, the final result must have been considerably retarded.

When the disease returns, it is singular that there is not only an affection of the lungs or other internal organs, but that there is not unfrequently a sort of special selection of bone as the seat of the fungous deposit; sometimes it is in the next adjoining bone, as in this case, where Mr. Babington removed the affected humerus at the shoulder-joint, and the clavicle of the same side was found to be in an incipient state of disease, the intervening joint and other soft parts being healthy; or as in cases such as I have mentioned, where Searjia amputated the thigh for a pulsating hæmatoid tumour of the tibia, and several years afterwards the same disease appeared in the femur, and destroyed the patient.

At other times, the bones generally are the seat of the malignant disease, and no other texture is affected. I mentioned the case of a patient of Mr. Arnott's in the Middlesex Hospital, where the disease returned some time

after the removal of the humerus for a fungous tumour of that bone ; in this patient numerous tumours reappeared in the bones, which looked like coagulated blood, or a portion of spleen, and the diploë of the skull was very extensively affected, and tumours formed on several parts of the head, besides which there were deposits in the sternum, the ribs, the opposite humerus, and several other bones ; but no sign of malignant disease was discovered in any other texture of the body. Mr. Travers has described a case of the same kind, in which a malignant tumour was situated in a man, on the outside of the right os innominatum, on the inside of the opposite bone, and on several ribs ; but not elsewhere, except that there was an ossification of a portion of one pleura. This selection of bone in numerous situations, without any disease of other textures, is a singular circumstance, since, when other textures are affected, some of the viscera are almost sure to be diseased, if the constitution is sufficiently impregnated with the morbid poison to occasion the appearance of a tumour in more than one situation.

Thus, then, we find that there are several tumours of the bones analogous to those of the soft parts, which might be almost considered as additions of these tumours to a bone ; viz., 1st, the fibrous tumour, which is innocent in its nature ; 2ndly, a cystic tumour of the periosteum, which is like the last, non-malignant ; and two forms of cystic tumour of the cancelli, the nature of which appears to be doubtful ; 3rdly, cancer of the bones ; and 4thly, all the three usual species of fungous disease, the medullary, hæmatoid, and melanoid, all of which, as well as the cancerous disease, are malignant in character. We have seen, also, that all these sorts of tumours correspond in most particulars with the similar diseases of the soft parts, with such differences as we might reasonably anticipate from the peculiar texture of the bones, when attacked with such diseases. And I am not without hopes that future researches may establish the distinctions between the several tumours of the bones, with such accurate discrimination of signs and symptoms as to guide us in their surgical treatment with considerable precision. [*Med. Gazette*, vol. xxiii.]

CASES OF SLOUGHING ABSCESS

CONNECTED WITH THE LIVER,

WITH SOME REMARKS ON THE ENCYSTED TUMOURS OF THAT ORGAN.

READ 11TH DECEMBER, 1832, AND 26TH FEBRUARY, 1833.

PART I.—AQUEOUS ENCYSTED TUMOURS.

CASE I.

William Hollock, æt. 31, was admitted into St. George's Hospital, under the care of Dr. Seymour, December 23rd, 1830, giving the following history of himself :—He said he had lived somewhat intemperately for several years

in the East Indies, where he had suffered from liver complaint. About seven weeks before his admission he was seized with pain in the right shoulder, followed in a week by violent pain in the situation of the liver, and about a fortnight after this, he perceived a swelling in the right hypochondrium; he was bled and had leeches applied, and had been salivated by mercury, but without any diminution of the swelling, or mitigation of his sufferings. The swelling was of an oblong shape, extending across the abdomen above the umbilicus, to the extent of about four inches, and was situated in the epigastrium and under the margin of the ribs on the right side. The tumour appeared to be connected with the liver, and it seemed that some hardness could be felt in that organ on each side of the swelling, which was very tender and painful, and fluctuated obscurely; but there was no redness of the skin, and the abdominal parietes appeared to be movable over the surface of the tumour. He complained of constant cough, with copious mucous expectoration. He was thin and looked several years older than he really was, and had an expression of great anxiety from intense suffering. His appetite was bad, the pain kept him constantly awake at night, the urine was high coloured, and there was a light yellowness of the skin and of the conjunctivæ, scarcely amounting however to jaundice. The pulse was 80 and feeble, the tongue clean and moist.

I was requested by my colleague to see him, and on the 15th of January, the tumour having become more prominent, and the fluctuation more evident, it was determined that it should be opened. I passed a trocar into the most prominent part of the swelling about two inches from the margin of the ribs towards the umbilicus, which entered the cavity of the supposed abscess at a depth of about three inches. Five or six ounces of fluid were evacuated through the canula at the time, without any pressure, and a good deal of the same fluid continued to escape through a gum catheter, which was left in the puncture. The fluid which was removed, was not like common pus, but thick and adhesive, of a dark, yellowish green colour, and of a peculiar though not offensive odour, and upon being mixed with nitric acid, it appeared to contain biliary matter. He was much relieved by the operation, the cough being lessened, and his rest better; and his health continued to improve till February 18th, when he had gained a little flesh, the discharge during the whole of this time having continued of the same quality, and in considerable quantity. I had been obliged, however, on February 1st, to remove the catheter, and slightly to enlarge the wound, the consequence of which was the admixture of a good deal of fluid blood with the matter, the bleeding appearing to take place from the interior of the cavity. At this time, February 18th, the edges of the puncture ulcerated slightly, the skin around became inflamed and very tender, and he suffered a good deal of pain, with increased discharge from the cavity, which continued

till the 22nd. A circular projection now took place on the left side of the aperture, as if the matter of the original abscess had not a free exit, or as if another collection of fluid was taking place; I therefore made another puncture with a broad lancet, about two inches and a half from the first, which gave exit to an ounce of the same fluid as before, with a good deal of arterial blood. He was still more relieved by this than by the former puncture, the discharge became more purulent and diminished in quantity, his health and spirits improved so much that he was able to walk about on the 1st of March, and by the 18th of April, three months from the first opening of the abscess, the cavity seemed nearly filled up, and he expected to leave the hospital in a short time. Now, however, what little discharge remained became mixed with a great deal of arterial blood, and the two apertures began to slough, with much redness of the skin; he began again to look thin and pale, with so much depression of strength that several ounces of brandy and an equal quantity of wine daily appeared necessary to prevent his actually sinking; and he fell into a complete state of despondency, expressing his conviction that he was going to die. He suffered at the same time such acute pain, that six grains of acetate of morphia in the day scarcely gave him any rest, his stomach being also irritable, so that he could not take laudanum.

On May 3rd, the two punctures were joined together in a black sloughing sore, about four inches broad, and two and a half in the short diameter, in the centre of which an aperture still admitted the probe into the original cavity (which seemed nearly filled up), below the integuments and muscles, the examination being always extremely painful. The black slough in the centre was surrounded by a thick prominent circle of integument, the edges of which were everted and ragged; and below the edges of the ulcerating and sloughing skin, were projections of unhealthy fungous substance, of a whitish colour; and each of these masses added to the size of the sore, as they were successively destroyed by sloughing. The skin around the ulcer was excoriated by the separation of the cuticle, and a circle of skin, three inches broad, all round the ulcer, was thickened and hard and prominent, and of a dark red colour. The discharge from the central opening, and from the surface of the ulcer was thin, and wholly unmixed with pus, but was accompanied with considerable hæmorrhage, and had a very peculiarly nauseous and foetid smell. The prominence formed by the integuments and muscles round the ulcer (which prominence could not be distinguished from the liver), with the hæmorrhage and peculiar discharge, and the unusual progress and singular appearance of the sloughing sore (wholly unlike an ordinary gangrenous ulcer, or the sore of hospital gangrene), suggested to myself, and to many other gentlemen who saw it, the idea of there being a tumour of *fungus hæmatodes* in the liver, with which the original abscess had

been connected. The same process continued till June 4th, the sloughing during the whole six weeks having been almost uniformly progressive, but now and then increased pain was observed, with more of the surrounding redness, and of the projecting masses below the edges of the skin, and the sloughing at these times became more rapid. The surface of the sore was now about fourteen inches broad, and ten in its lesser diameter, from above downwards; great masses of dead skin and muscle had been sometimes cut away, but no tumour had made its way outwards, which seemed at one time probable; the sloughing having also not quite destroyed the whole thickness of the abdominal muscles. Nearly the whole of the abdomen and lower part of the chest around the sore was now of a dark red colour, and presented the prominent and hardened appearance before alluded to, but in a less degree than when the ulcer was smaller. He had now become much emaciated, and required much support, but his appetite did not fail, and he seemed chiefly affected by the excessive pain which prevailed to the last. There never was the least attempt to throw off the sloughs, and form granulations, the sloughs being the whole time attached to the living parts. He died June 11th, worn out by the pain and irritation, about five months after the abscess was first opened.

It is scarcely necessary to mention the variety of local remedies that were employed to check the sloughing: carrot poultice, stale beer poultice, hemlock poultice, solutions of opium and hemlock; stimulants of clove, turpentine, Fryar's balsam, Peruvian balsam, Barbadoes tar; black wash; solutions of mineral acids and of the chlorides, and concentrated nitric acid. On the whole he seemed to be most relieved for a time by chlorine washes, and by a mixture of conserve of roses with goulard and laudanum, but nothing appeared to have any decided influence in stopping the disease.

On examination after death, it was found that nearly the whole thickness of the abdominal parietes had been destroyed, so that little besides the peritoneum remained, which adhered in part to the corresponding surface of the liver; there was no sign of peritoneal inflammation even close to the sloughs, though so near the membrane. To our great surprise there was no disease whatever of the liver, except slight condensation and granulation, such as is found in persons accustomed to spirits, but this change was by no means well marked. There were no remains of the cavity, which formerly contained the matter, and the only morbid appearance found was slight thickening of the peritoneal covering of the liver, united with that which lines the abdominal muscles; this thickening having taken place to the extent of about an inch, and to the depth of little more than a line, in the centre of which was seen a white substance, looking like a cicatrix, which extended perpendicularly into the liver, to the depth of about half an inch, around which, however, the liver seemed as little altered in appearance as in any other part. All the other viscera appeared to be quite healthy.

CASE II.

Mary Mullens, æt. 22, was admitted into St. George's Hospital, April 30th, 1832, under the care of Mr. Babington, who has been so kind as to give me the following history of the case, which I frequently saw during its progress:—Three months before her admission, after what she called a violent cold, she was attacked by pain in the region of the liver, and about a month after the pain commenced, she observed a small swelling about three inches above the umbilicus, and midway between the linea alba and the edge of the lower ribs on the right side. The swelling had been progressively enlarging since that time, with very considerable pain; she had become jaundiced, and her general health was much disordered. She had been bled, and had had leeches applied. On her admission there was a large fluctuating tumour, situated at the under margin of the liver, and apparently intimately connected with it, with considerable induration around the swelling, which prevented the outline of the liver itself from being distinguished. There was considerable pain and tenderness on pressure; the whole surface of the body, and the conjunctivæ were of a very light yellow tinge;—the pulse low and weak, and very rapid;—the tongue dry and covered with a foul brown fur;—the countenance anxious, as if she was suffering from confinement of matter. The next day, May 1st, a needle was introduced into the swelling, and on its being ascertained that it contained matter, the opening was enlarged by a lancet, and above 8 oz. of matter evacuated, which gave her immediately great relief from pain; it was allowed subsequently to escape into a common poultice. The fluid which was evacuated was thin, and of a light brown colour, and could scarcely be called purulent;—it was mixed with nitric acid, but the existence of bile in it was not satisfactorily made out, as it appeared to have been in the former case. The relief from the pain and fever continued, and she was on the whole less jaundiced, but she had occasionally an attack of fever, and increased pain and yellowness, which was always relieved by a calomel and senna purgative. The discharge continued to be of the same kind, but was occasionally mixed with blood.

In the beginning of June, though her general health was on the whole improved, the discharge became nearly constantly dark, as if mixed with blood;—excoriation came on in the skin around the puncture, which, by June 26th, extended over a surface as large as an orange, but unattended with much pain, and the integuments below the excoriated part were hard and prominent, as if germinating a fungus; the depth and circumference of the cavity were, however, now a good deal diminished. In a few days after this report, the hardness was succeeded by sloughing of the aperture, which spread slowly and gradually, but with occasionally increased rapidity to a

considerable size. The hardness and redness of the skin and separation of the cuticle around the ulcer always preceded the sloughing, and it was observed that a deeper orifice, probably that in the lower tendon of the rectus muscle near the sac, increased slowly in size, while the sloughing of the integuments and abdominal muscles above took place to a much greater extent. The discharge still continued thin and watery, and occasionally mixed with blood, and the smell was peculiarly nauseous and disagreeable, and the excoriation of the skin was invariably greater if the discharge was allowed to rest upon the surface. Masses of white fungous projections were sometimes seen in the cellular texture, where it was exposed by the sloughing of the skin. A variety of applications were employed without avail, as in the former case, and the patient sunk under the disease on the 26th of October; at which time the sloughing surface was about seven inches broad in one direction, and of nearly the same extent in the other, the sloughing process having thus continued for nearly four months.

The cast of the ulcer, which is presented to the notice of the Society, was taken about the middle of this period, but does not sufficiently point out the differences between the characters of the sloughing sore in these two cases, and those of ordinary gangrenous ulcers; the central orifice also at the bottom of the slough is scarcely shown in the cast, but may be perceived in some measure in the preparation of the diseased parts, which I have also placed upon the table.

On examining the body it was found that the sloughing had destroyed nearly the whole thickness of the abdominal muscles, in the centre of the sore; the peritoneum lining them being loosely adherent to the surface of the liver, and both layers of this membrane being dark-coloured, and almost, if not quite, dead. The cavity of the peritoneum, however, was entire, nor was there any trace of inflammation except to a very small extent round the central opening. The structure of the liver was remarkably healthy throughout, and it was of its natural size; on making a section of it from behind, towards the slough, the line of its natural surface was also seen to have been preserved, but close to the peritoneal covering was a yellowish white mass about the size of a small nut, with slight condensation of the liver around it to the extent of an inch. This substance was broadest towards the slough, and its apex extended about half an inch into the substance of the liver. There was no appearance of the cavity in which the matter was originally confined, unless both in this, as well as in the former case, the white substance was to be regarded as a kind of cicatrix left by the complete obliteration of the cavity. The other viscera were quite healthy.

Throughout the whole progress of this second case the sloughing was much less violent than in the first; there was much less redness of the skin, less

induration, less pain and tenderness; the hæmorrhage was not nearly so great, and the patient had less appearance of suffering and anxiety; partly, perhaps, on account of the slower progress of the sloughing, and partly from her having been of a much less irritable temper than the other. But with these comparatively trifling differences, the two cases were very similar to each other. Both of these patients were seized with symptoms of inflammation of the liver, followed by the formation of a tumour, containing fluid, and apparently connected with the liver, and in both of them the fluid was not like that usually contained in an abscess of the liver, though in one, if not in both of them, bile was mixed with the fluid. The patients were both relieved for a time by evacuating the fluid, and the cavity appeared to contract, with proportionate diminution of the discharge, and after death, they were found so far obliterated, that it was difficult to decide positively where the fluid was situated, unless it is conceded that the little firm spot before described was the remains of the cyst in which the fluid had formerly been contained. In both cases, about a month after the puncture was made, a new action seemed to take place, the discharge became mixed with blood, and a sloughing sore was produced, having a peculiar appearance, and attended with excessive fœtor, and wholly unchecked by either local or constitutional remedies; the aspect of the sore being so peculiar as to suggest the idea of its being the result of a malignant disease, and probably being of the nature of fungus hæmatodes. So singular indeed was this appearance, that, notwithstanding his experience of the result of the former case, my colleague could not help entertaining the same opinion, when the second case came under his own care. Hollock, indeed, appears on the first commencement of this change in the actions of the part, to have had strength of constitution to throw it off for two months longer, but when it recommenced, the progress of the sloughing was so much the more rapid; so that he was carried off by it ultimately in the same time as Mullens; both the patients dying about five months after the abscess was opened. Yet when these patients were examined after death, not only was there no fungus hæmatodes of the liver, but in one case this organ was remarkably healthy, and in the other there was found so little deviation from the natural structure, and that alteration of such every day occurrence, as to be quite insufficient to account for the very singular appearance of the disease, which, as far as I know, has never been described.

It is quite clear, I think, that although the first symptoms of the disease resembled those of *abscess in the liver*, they were not really cases of this kind. The matter evacuated was not purulent, and did not resemble what I have seen in any case of abscess of the liver;—when an abscess forms in this viscus, it takes place in its *substance*, not immediately *below the peritoneal membrane*, and when it makes its way towards the surface, it leaves abundant

evidence of the inflammation and ulceration which have attended it ;—nor could the cicatrix of an abscess of this organ be so wholly local, as to resemble little white bodies, which seemed to be the remains of the cysts in these cases. The instances, indeed, in which an abscess of the liver does cicatrize, are extremely rare, and such a process is at least not likely to take place, without a particle of healthy pus, and while a formidable sloughing sore communicated with it ; nor do I know any case in which sloughing of a peculiar kind took place after the puncture of an abscess of the liver. Neither were these cases, which I have narrated, instances of *abscess in the abdominal muscles*. It is true that an abscess, situated *over* the liver, will sometimes produce pain in the right shoulder, and jaundice ; and may thus suggest the idea of its being *within* the liver, but such a mistake can only take place previous to a puncture being made. The depth and the situation in which the matter was secreted, in these cases, and the nature of the fluid, at once disprove this supposition, independent of the preceding symptoms. In passing the trocar into the cavity, I thought the depth of two inches must, in a thin person, have penetrated the thickness of the parietes of the abdomen ; and when it had reached this depth, I withdrew the trocar, to see if any fluid would flow through the canula, but I was obliged to pass the instrument nearly an inch deeper before the point entered the cavity, in doing which there was a sensation conveyed to my finger of its having passed through a thin layer of the hard texture of the liver. The fluid was also in both cases such as I have never seen formed in abscess of cellular membrane, and certainly in one, if not in both of them was mixed with bile, which is scarcely likely to occur in an abscess of the abdominal muscles which has proceeded inwards, extravagant indeed as such a supposition must at once appear.

My impression, from a consideration of the symptoms and peculiar progress of these cases, and the examination of the parts after death, is that the disease originated in one of those *encysted tumours*, which not unfrequently form on the surface or at the margin of the liver, below the peritoneal coat, and which may be termed *aqueous encysted tumours*.—These cysts are met with also in a variety of other situations, on the surface of the spleen or kidney, in the spermatic cord, where they are called encysted hydroceles,—in the orbit—in the brain—in the neck—or breast. It is in the ovaria, however, that they perhaps occur most frequently, where they constitute a form of encysted dropsy, described by my friend and colleague, Dr. Seymour, and other pathologists, as depending on an enlargement of the Graaffian vesicles. It is here also that they are seen of the greatest dimensions ; in a patient, for instance, whom I tapped for the first time in December 1830, I have removed, within the last twelve months, at nine different operations, no less than 530 pints of watery fluid ; so that in addition to the ordinary

secretions of the body, there must have been formed in the sac on an average, during the whole of this time, about a pint and a half daily, and yet her health has not suffered materially except when the distension becomes very great.*

It has been imagined by Dr. Hodgkin and some other writers, that these cysts originate in the obstruction of an excretory duct in a secreting organ, and Sir A. Cooper in describing a disease of the testis of an analogous, though, in some respects, different kind in that organ, advances the same opinion of the cells which are there found; but as the enlarged cysts connected with obstruction of the pancreas or salivary glands contain, in their simple state, fluids resembling the natural secretions of those glands, while the cysts in the liver or kidney contain nothing in the least like bile or urine till inflammation has taken place,—and as the encysted tumours of this kind in the liver contain precisely the same fluid which is met with in corresponding encysted tumours of the brain or other parts, where there are *no* excretory ducts,—I am more inclined to attribute their formation in *all* cases to the same cause (whatever that may be), than to suppose that they sometimes originate in an obstructed duct, and at other times in cellular texture.

In the 15th vol. of the Transactions of the Society, these cysts, which form in the liver and other situations, are termed by Dr. Hodgkin, *adventitious serous cysts*, from their resemblance to the serous membranes in structure and in the nature of their contents; and in the last volume the same term *serous cyst* is employed by Mr. Lawrence in nearly the same sense, when speaking of some cysts which had been under his care. But it appears to me that in speaking of them in the liver, and perhaps in other situations also, the term *aqueous encysted tumour* will better express their nature and origin.

In the first place, the term *encysted tumour* seems to suggest at once the idea of a single membrane secreting its contents, while *serous cysts* are met with in circumstances where they cannot be called *encysted tumours*. There is, for instance, an occasional though rare form of fatty tumour covered by a membrane which is more like the serous membranes in one respect than the cysts we are speaking of, as the thin cyst belonging to it has its reflected and loose portions, like the pericardium, distinct and moveable upon each other, though not containing fluid. Delicate cysts secreting serous fluid are also met with in at least four other orders of tumours, besides the kind at present under consideration, one of which only, resembles them enough to be called an encysted tumour, and this other order, which is also found in the liver, may be called an *hydatid encysted tumour*. The *aqueous encysted tumour*,

* Since this was written, the quantity removed within twelve months amounted to 620 pints [see vol. i., page 97].

and the *hydatid encysted tumour*, will thus form two orders of a class, in which may be included three others also, which might properly perhaps be called the *sebaceous encysted tumours*, the *bursal encysted tumours*, and the *congenital encysted tumours*; the last three of which, however, do not either of them, I believe, occur in the liver, and I shall not therefore further allude to them at present; though I must confess there seems to be so much confusion in the terms used in the description of the numerous cases in which *cysts* are met with in different tumours, that I should feel almost inclined to attempt a practical arrangement of them at some future time, unless the subject is previously taken up by some more competent person.

2ndly. I prefer the term *aqueous encysted tumour* to that of *serous encysted tumour*, because probably in the origin of all of them the contents are not *serum*, but nearly *pure water*, till the secretion has been altered by inflammation and other circumstances. In other situations indeed, the tumours seldom increase to any great size without some inflammatory action, in consequence of which, albumen is deposited, but it will be seen in the cases I shall subsequently mention that the cysts increase in the liver to a great size, and yet heat will not produce coagulation. This accords with the observations of Dr. Marcet,* who found on examining an hydatid as he terms it (by which it is evident he means an aqueous encysted tumour attached to the kidney), that 1000 grains of the fluid contained in the cyst, left 27·3 of animal matter, which he terms *mucro-extractive* matter, which was not coagulated by heat, nor gelatinized by cold or concentration, with a saline mass weighing 8·7. In another case, which he describes, a woman laboured under some symptoms of hydrothorax, and a tumour appeared on the side of the chest, which was punctured, so as to afford exit to about a pint of clear and colourless water, which Dr. Marcet at once suspected to have come from an encysted tumour of the lungs because it contained *mucro-extractive* matter, and not *albumen*. I have under my care at the present time, a child with a tumour at the side of the abdomen, the history of the formation of which led me to suppose that it was formed by serous effusion into the peritoneum in consequence of an injury, but upon puncturing it, 18 ounces of water without albumen were evacuated, rendering it probable that the fluid is connected with one of the very tumours under our consideration attached to the liver or kidney unless it has been derived from a cyst of fungus hæmatodes in which similar fluid is often found [see *postea*, p. 174]. If then we pay regard to the nature of the fluid contained in these cysts in the liver, the term *serous cyst* is only applicable to the middle period of their growth; after the fluid has lost its aqueous qualities, and before it has been further changed into purulent fluid, or some one of those numerous kinds of liquid

* In the 2nd volume of the Transactions, p. 376.

or half solid substances which are sometimes found within the cysts. The name *aqueous encysted tumour*, being derived from their first formation will on the other hand be always applicable to them, if the subsequent changes which the fluid undergoes are borne in mind.

3rdly. I prefer this term to that of *serous cyst*, if we regard the *structure* of the cyst itself, as the membrane which secretes the aqueous fluid undergoes considerable changes, in general accordant with the alteration of the secretion. The serous cyst therefore, if the name is given to it from its structure without reference to its contents, becomes changed into a fibrous cyst, or a half solid tumour, or a cartilaginous or an osseous cyst, from some alteration in the action of its vessels during its growth. In the liver, indeed, the cyst is more frequently changed into bone, than into a very firm, fibrous cyst, such as is frequently seen in other parts of the body; but I shall mention one case in which even in the liver the cyst was about a quarter of an inch thick. It may be said, perhaps, that somewhat similar changes are observed in the natural serous membranes, and on this account no doubt the term serous cyst is less objectionable than for the other two reasons I have given. On the whole, however, I think an *aqueous encysted tumour* is a name which will best express the nature and origin of the tumours, in which I believe the two cases which I have already related, first originated; though any term which is derived from one period only of a disease must be received with considerable latitude, if it is employed still, when various changes have been effected in it.

Every person who is in the habit of examining the human body after death, must have often seen these aqueous encysted tumours on the edge or surface of a healthy liver, or slightly embedded in its substance, where they are met with of various sizes, but seldom above that of a walnut; but the fact of their enlargement so as to constitute a disease, and the symptoms produced by the tumour during its progress, are probably little known, and often confounded with those of other diseases. Indeed the cyst will sometimes increase to a considerable size, and yet the symptoms will remain comparatively trifling as long as the first simple characters of the complaint are still preserved.

CASE.—A boy, about 12 years of age, was admitted into St. George's Hospital, under the care of Dr. Chambers, in August 1822, when I resided there as house-surgeon, having a tumour of considerable size below the ribs on the right side, the ribs being raised by the tumour, which evidently fluctuated. He had not the least disturbance of the system, nor any derangement of the functions of the liver, much less were there symptoms of an abscess of that organ; the skin was quite moveable, and free from inflammation, and slight inconvenience from the size and pressure of the tumour, was

alone complained of. After he had been in the hospital a short time, a flat trocar was introduced by Mr. Brodie below the ribs, in the part where fluctuation was most distinct, and a pint and a half of clear colourless water was drawn off, which did not appear to contain any albumen, as no coagulation was produced by heat. Pressure was made by a bandage after the operation, which appeared to produce complete obliteration of the cyst, for the wound healed directly, the boy had not the least fever or other bad symptom from the operation, and left the hospital perfectly cured.

By the curious coincidence which is so often observed with regard to unusual medical cases, Mr. Brodie had under his care nearly at the same time, another case of the same kind, which he has published an account of, in the *Medical Gazette*,* these being at the time of the publication, the only two cases of the kind which he had seen.

CASE.—The greater size of the tumour in this patient, a young lady of 20 years of age, prevented her from taking exercise, and from sleeping except in a particular position; and there seemed to be some slight inflammation, as she had some pain at the commencement of the disease, a year or two before, which was increased before the operation, and she suffered from a troublesome and almost incessant cough for the first two or three weeks afterwards. Three pints of the same watery fluid were evacuated, uncoagulated by heat, and with the smallest possible quantity of animal matter. The result of this case is, however, more conclusive than the former, as Mr. Brodie had seen the patient six years afterwards, at which time there had been no return of her former symptoms.

These two cases will therefore serve to show, that, in the early stage of the disorder, while there is little or no inflammation, the symptoms produced by the tumour are purely those which arise from its pressure upon the liver and adjacent parts; and they serve also to show that a puncture may be safely made into the cyst with a trocar, with the view of obliterating the cavity by union between the sides of the cyst. The next case will show, however, that even after inflammation has taken place, so as to alter the nature of the fluid in some measure, the same result may be obtained.

CASE.—A boy, of 14 years of age, was under the care of Dr. Thomson,† in consequence of a tumour in the right hypochondrium, tense and elastic, and projecting forward so as to be of the size of the fist, and affording an indistinct sensation of fluctuation. The tumour had been growing for two years, and the boy had been twice salivated as for hepatitis, but there never was any pain; there was some sallowness, but no jaundice of the skin, and the general health was unaffected; the boy complained only of considerable difficulty of breathing, and of being wholly unable to sleep

* Vol. i., page 334.

† *Med. Gaz.*, vol. i., 468.

except in a nearly erect posture. The tumour was punctured with a hydrocele trocar, and upwards of three pints of watery fluid evacuated, which, however, slightly coagulated on the application of heat. The wound healed, and the discase probably did not return. Sometimes it appears that the cyst may increase to a very great size, and yet the symptoms may not be sufficiently evident to avoid the chance of mistake.

CASE.—Dr. Thomas* mentions a lady who was treated for a long time as for an enlarged and indurated liver, but without those symptoms of biliary derangement, which ought to have led to such a conclusion ; and on being tapped, sixteen pints of water are said to have been drawn off, the last part of the fluid being mixed with a little lymph. It is said to have been a large hydatid, by which, however, is evidently meant an aqueous encysted tumour. The result of the operation is not mentioned, so that it may probably be concluded that the case ended fatally.

But although it appears from this case that a very large quantity of fluid may be collected in these cysts before such pressure is produced as to render an operation absolutely necessary, it will in general be found, that long before the tumour reaches this great size very urgent symptoms are produced by it. These symptoms will still be principally produced by the encroachment of the tumour upon the thorax and consequent compression of the lungs, and if the tumour is so situated as to enlarge chiefly in that direction, the symptoms may for a long time be very obscure, and appear like hydrothorax or hepatization of the lungs, or actual effusion of fluid into the pleuræ may take place ; each of which circumstances will be seen in the following cases.

Such a case as the following, indeed, which is described in the "*Hist. de l'Acad. des Sciences (1732)*," would have probably puzzled any person, as the liver and lungs were all affected.

CASE.—A soldier complained, for two years before he died, of very great difficulty in breathing, so that he could only exist in a sitting posture. There was found, after death, a cyst on the superior surface of the liver of about three inches in diameter, and containing a yellowish green limpid fluid, and at the bottom of each lung, below the pleura, there was a cyst of a white colour, and a line in thickness, each cyst being about six inches in one diameter, and four in the other, and containing a clear and limpid fluid. All three of these cysts were, no doubt, aqueous encysted tumours. The symptoms will also become obscure if the cyst is much thickened, so as to give very much the same feeling as that which is communicated by a solid tumour. Dr. Abercrombie mentions a case of this kind,† where fluctuation was with difficulty perceived, although a cyst was punctured, from which

* "*Practice of Physic.*"

† Abercrombie on "*Diseases of the Stomach*," p. 356.

9 or 10 pounds of clear serous fluid were evacuated, and when the patient died, a few days afterwards, another cyst was found between the liver and the posterior part of the diaphragm, containing no less than 18 pounds of clear fluid, in addition to the large quantity that had been extracted from the anterior cyst. The complaint was of only about a year's standing, but from their great size, these two cysts had so much injured the patient's constitution, that although he was relieved by the operation, his strength quickly failed. At the bottom of one of these cysts were two flat bodies consisting of a roll of soft gelatinous membrane which seemed to have been detached from the interior of the cyst. But if the existence of a cyst containing fluid on the surface of the liver be large enough to be distinguished through the abdominal muscles, it may be right to puncture it with care, in order to prevent a fatal result from rupture, even if the pressure is *not* such as to render an operation urgent on that account alone.

CASE.—A man was brought to St. George's Hospital in June, 1821, very soon after he had fallen from a waggon, some empty baskets having also been thrown down, which fell upon his abdomen as he lay upon the ground. He had been bled before his admission, and was in a very low state, with laborious respiration, and violent pain, and presented the appearance of a man dying of internal hæmorrhage, except that his countenance was not so pallid as it usually is in such cases. His pulse soon rose, and he was again bled, and had thirty-six leeches applied to the abdomen, which had become very tumid and painful. He died, however, a few hours after his admission in excruciating agony.—On opening the abdomen about two quarts of slightly coloured serum were found in the cavity of the peritoneum, which had escaped by the rupture of a large cyst, that lay loose and flaccid on the right side, reaching from the diaphragm above, to which it was firmly united, nearly to the spine of the ilium. This cyst occupied almost entirely the place of the right lobe of the liver, a thin layer of which was partly expanded over the cyst, while the left lobe and lobulus spigelii were much larger than natural, but perfectly healthy. The interior of the cyst was irregular, and contained, lying loose within it, a thick membrane, which was called by some an hydatid, but which was, no doubt, a layer of lymph thrown out by the interior of the cyst, similar to the bodies already mentioned in Dr. Abercrombie's case, and disengaged by the rupture; for its outer surface corresponded exactly with the irregularities of the inside of the cyst, and it could be separated into many layers, the edges of which floated loosely from its inner surface into the serous fluid, which the cyst contained.—No history could be obtained of the previous symptoms, which may have existed in this man, but he had probably not suffered much, as he was actively engaged at the time of the accident, and had the appearance of good health. At all events the fluid was not in the least degree purulent, and although its

nature appeared at the time obscure, I have now no doubt that it was one of these aqueous encysted tumours.

This case then shows us the effects of further inflammation in the interior of the cyst, in the formation of a thick layer of lymph; and also the result of continued pressure upon the structure of the liver itself, ending in the expansion of a layer of the liver over the cyst, and the almost entire destruction of the right lobe by absorption, without any suppuration, an effect which was also observed in a case I shall presently narrate. It must not be supposed, however, that the danger of rupture by an accident will only attend a large tumour.

CASE.—A girl of 8 years of age, had a tumour in the situation of the liver for a considerable time, when she was pushed down violently, and the tumour suddenly disappeared. There succeeded severe inflammatory symptoms with violent purging, of which she died in a short time.—In the inferior and convex portion of the right lobe of the liver was a rupture to the extent of three or four inches, on separating the edges of which there appeared a cavity lined by a cyst, about a line in thickness, which had been ruptured in the same line, and contained nothing whatever, neither vesicles nor hydatids, nor any fluid, nor were its contents discovered, as the abdomen contained no more fluid than usual.*

I conclude, from this history, therefore, that the cyst must have been one of these encysted tumours, the contents of which, being aqueous, had been in part absorbed from the cavity of the peritoneum, into which it had escaped after the injury.† It is not impossible that the cyst may sometimes be ruptured spontaneously, and a cure effected by the absorption of the fluid from the peritoneal cavity.

CASE.—A man, after an eruptive fever was attacked with a sense of weight and pain in the epigastrium and left side, with troublesome cough succeeded by a tumour in the epigastrium. About a month afterwards he suddenly felt the weight detached from the situation of the chest, and descend into the lower part of the abdomen, and chiefly into the right ileo-colic region. There ensued violent pain and vomiting for two hours, succeeded by a state of syncope and insensibility for two hours more; the patient continued in a state of violent agony for some time, but in eight days was out of danger, the tumour not having again made its appearance.‡ This case was believed, by the narrator, to have been an encysted dropsy of the liver, *i.e.*, what I have called an aqueous encysted tumour.

It will be seen from the two next cases that the further effect of these

* "Hist. de l'Acad. des Sciences, 1759."

† A similar case occurred to Dr. Gregory of Edinburgh, no fluctuation being perceived before the rupture, though apparent afterwards. "Abercrombie on Diseases of the Stomach."

‡ "Ann. de Montpellier," vol. xii.

tumours will be the production of sickness and indigestion by pressure upon the stomach, hydrothorax, ascites, and anasarea of the legs from pressure upon the great veins, and a fatal disturbance of the general health.

CASE.—A little girl fell, and received a contusion in the epigastrium, which was, however, little attended to, though she complained constantly of pain. In a year's time a tumour formed, which was hard, no fluctuation was discovered, and the skin was unchanged. The respiration became much impeded, the child became weak and emaciated, and after some time died.—In the cavity of the peritoneum were five or six pints of water, and in the liver were two cysts, each containing three or four pints of water. One of the cysts was situated in each lobe of the liver, and one of them had been ruptured, nearly the whole of the liver itself had been destroyed by the growth of the tumours, and the lungs also were much compressed. It is expressly observed that there were no hydatids, so that these two cysts were, no doubt, of the kind under consideration.*

The following very interesting case of this disease is related by Dr. Hastings,† which shows the great size these cysts may attain, and the symptoms which attend them, and in this case also two cysts were formed, but with the curious circumstances, if I rightly understand the account, of one cyst only being close to the abdominal muscles, while the other was above the liver, so as to push the viscera away from the diaphragm.

CASE.—The patient, a soldier, 37 years of age, was first attacked by pain in the hypochondrium and right shoulder two years before Dr. Hastings saw him, and the symptoms had gradually increased with great pain. The abdomen was hard and tumid, and for the most part incompressible; fluctuation was perceived in the pit of the stomach, at first only when he was in the erect posture, but latterly, even when in the supine position, and when he coughed, a considerable protrusion was observed at this part. There was also distinct fluctuation at the lower part of the abdomen. He was tapped by means of an incision with a scalpel, about three inches below the point of the sternum, and about nine pints of fluid were evacuated, the nature of which is not stated. He was much relieved, but two days afterwards his breathing having again become laborious, the canula was a second time introduced into the former wound, and four pints more of fluid were evacuated, after which there was a constant oozing till his death nine or ten days afterwards. The seat of the whole of the fluid which had been evacuated is said to have been a fine membrane, forming largish cells, and situated between the peritoneal covering of the liver and the abdominal parietes, no communication existing between the cells of this membrane and the general cavity of the abdomen. The liver seemed almost to fill the

* "Journal de Medicine," vol. i., p. 120. † "Midland Med. Reporter," Aug. 1829.

cavity of the abdomen, and extended downwards nearly to the pubes, while it pushed up the diaphragm as high as the second rib. The liver adhered extensively to the diaphragm, and between the diaphragm and the liver itself, a vast cyst was formed, which contained nearly fourteen pints of bloody serum; the liver being in other respects healthy. In the abdomen were about eight pints of fluid, somewhat viscid and tinged with bile. The lungs were small and remarkably collapsed, and the cavity of the thorax contained several pints of fluid. The dissection of this very interesting case is not so clearly described, as might be wished, but Dr. Hastings himself imagines both the cysts to have been instances of the aqueous encysted tumours of the liver. It is said, also, there was a small quantity of purulent matter, but where this was found I cannot exactly understand, but I think it is meant to have been discovered in the cavity of the abdomen; it is remarked, however, that no ulcerating surface was perceived from which the pus had been formed.

The preceding cases seem to me to illustrate all the symptoms of this disease, and its consequences upon the neighbouring organs, with the exception of suppuration, and a knowledge of them would in general, I think, enable a careful observer to ascertain the existence of the tumour, and to adopt the only means, which would be likely to relieve the patient from the pressure of the tumour, with a fair chance of success. A case is narrated, however, by Dr. Todd,* in which a mistake might be made without discredit, on account of its rarity.

CASE.—A girl 14, suffered much pain, succeeded by a tumour in the right hypochondriac and epigastric regions, extending even below the umbilicus, which evidently fluctuated to the right of the linea alba below the ensiform cartilage; the result being emaciation and anasarca, while her skin was of a deep orange colour. It was treated as an abscess, but there were no *rigors* or other symptoms, which could be considered as indicative of suppuration, but, as it appears to me, the symptoms were rather those of extreme irritation and pain from pressure, and might therefore be considered as perhaps arising from one of the tumours under our consideration, though the deep tinge of the skin and the anasarca are not often met with. This fluctuating tumour was opened and two quarts of viscid bile evacuated, with a little thin fluid which was supposed to come from the peritoneal cavity. The girl died the next day, when the tumour was found to have been formed by a singular distension of the gall-bladder and the biliary ducts; which still contained another quart of the same green bile, the liver being quite healthy, and the tumour having been produced by the pressure of what is termed a scirrhus pancreas upon the ducts. There wants then but the occurrence of a higher

* Dublin Hospital Reports, vol. i., p. 325.

degree of inflammation, than what took place in any of the preceding cases, and the production of suppuration, to carry the chain of connection between a simple aqueous encysted tumour of the liver, and the tumours, the sloughing of which was related in the early part of the paper, and such a circumstance is found, I think, in the following case related by Dr. Stocker.*

CASE.—A man was seized with pain in the right shoulder and right hypochondrium and slight jaundice, which were considered to indicate the existence of hepatitis. About a month afterwards there was a sudden discharge of blood and pus by stool, and a few days afterwards, after a fit of almost complete suffocation, he coughed up from the lungs a large basin full of puriform matter. From this dangerous attack he nearly recovered, but never regained his health entirely, and suffered from occasional rigors, at intervals of a few weeks, puriform matter being still coughed up in small quantities. He died two years after his first attack, when the following appearances were discovered. A *cyst* was found on the anterior surface of the liver, containing some purulent and grumous fluid. The interior of the cyst was of a vascular texture, and it extended from the left lobe of the liver to the stomach and spleen and to the small intestines, which were all united together; but the communication with the intestinal canal was not perceived, and even the aperture in the diaphragm, by which the matter had been discharged into the lungs was cicatrized at the margin. The liver was large and of a firm consistence, but did not form any part of the abscess, nor were there any tubercles in it. It cannot of course be affirmed positively by any one who did not see it, that this abscess was in one of the aqueous encysted tumours, but from the terms employed, I think it at the least highly probable. —The existence of a cyst connected with the liver, but the liver being healthy and forming no part of the cavity of the abscess;—the expression *vascular nature* applied to this cyst, which can scarcely be said of an ordinary abscess, the interior of which is generally more or less granulated and coated with lymph; the words puriform and grumous fluid, instead of pus, employed to describe the contents of this cyst; all lead me to this conclusion rather than to the idea of its having been an abscess of a more common kind. The two cases of sloughing cyst seem to me to have been modifications of abscesses of the same kind, which had made their way towards the abdominal parietes, instead of ulcerating into the lungs and intestines.

From the peculiar nature of these cysts, and of their watery secretions, we should not expect that they would often suppurate, for the same reason that the serous and synovial membranes do not often form pus; we should naturally anticipate also, that when anything like pus is formed in them, it would not be *healthy* pus, but partake more or less of the aqueous and

* "Trans. of the Coll. of Phys. in Ireland," vol. i. p. 11.

mucilaginous secretions of the less inflamed cyst, and hence no doubt the cause of the peculiarity observed when the fluid was evacuated, and during the whole time they continued to discharge in the two cases alluded to. In Dr. Stocker's case, however, supposing it to have been one of this kind, as much ulceration was produced in cellular texture, especially in the formation of the large cavity in the lungs which communicated with the cyst, the secretion would necessarily be mixed with more of the usual kinds of pus.—It is remarkable, moreover, and confirmatory of my opinion, that when an *hydatid encysted tumour* of the liver suppurates, the cyst, which resembles the cyst of *aqueous encysted tumours* of this organ, forms a similar thick, tenaceous, or watery and mucilaginous fluid instead of pure pus.

It seems in the next place to follow as a necessary consequence of the nature of the fluid, that there should be less of the rigors and perspiration, which usually mark the formation and confinement of matter in ordinary abscesses; nor was this circumstance wanting in these two cases, and it may perhaps be looked upon as another diagnostic mark between an abscess of the liver, and suppuration in an aqueous cyst. In both of them the symptoms were rather those of intense suffering and irritative fever than of distinct suppuration, the indications of which, though sometimes obscure, are seldom altogether wanting in either the acute or chronic abscess in this important organ, and the rigors and perspiration are generally accompanied with more marked jaundice than in the aqueous tumour, even when suppurating; the skin being in one of these cases altogether free from a biliary tinge, and in the other the colour being a peculiarly light yellow.

It only remains for me to account for the remarkable termination of these cases, in the occurrence of frequently repeated hæmorrhage from the cavity of the cyst, and the singular fungous ulceration which took place around the openings. I cannot, it is true, do this by reference to any similar case, otherwise I should have had to apologize more than I am perhaps even now called upon to do for the length of this paper, but the analogy of similar aqueous encysted tumours in other parts of the body will still bear out the probability; indeed the whole progress of the disease is similar to what takes place in other tumours of this kind, but I will confine myself at present to the hæmorrhage and fungous growth.

The occurrence of hæmorrhage in aqueous encysted tumours will be shown in the following case, for which I am indebted to Mr. Brodie.

CASE.—A woman had a tumour in the neck apparently connected with the thyroid gland, which was punctured, and a small quantity of watery fluid evacuated, but the cyst now became filled with blood, and when reopened, hæmorrhage continued to take place into its cavity. Mr. Brodie dissected out the cyst, which was thin and membranous, but the patient being of a bad

constitution, sloughing took place, which process was also accompanied with a good deal of hæmorrhage, and the woman died of the disease.

So also, although the aqueous encysted tumour of the female breast, in which organ it not unfrequently occurs, will sometimes become obliterated by pressure, after a puncture has been made, in the same manner as in the corresponding encysted tumour of the liver, the wound will in other cases remain open and generate an unhealthy fungus.

CASE.—A young woman attended as an out patient of St. George's Hospital with an encysted aqueous tumour at the upper margin of the breast, which fluctuated obscurely, and being punctured by Mr. Brodie several ounces of water were let out. The wound, however, did not heal, and the discharge continued from the cyst, the edges of the opening became thickened and everted and ulcerated, and an unhealthy fungus was generated, with a good deal of pain and constitutional irritation; a circular ulcer was thus formed by the growth of the fungus with very little loss of skin, which was about three inches in diameter, raised and prominent like the ulcer of fungus hæmatodes, but with a central depression leading into the opening of the cyst. There was a copious discharge of thin and very foetid fluid, the whole breast was enlarged and condensed around the cyst; and the skin around the ulcer to some extent had a dark inflammatory appearance. She was under these circumstances taken into the hospital, and the whole of the diseased mass, including the breast, was removed by Mr. Walker. The wound healed readily, and the patient has since continued well.

A sebaceous encysted tumour will also occasionally inflame and ulcerate, and throw out an unhealthy fungus, with much constitutional disturbance. When such a fungous tumour is formed under these circumstances, it is often spoken of as having assumed the characters of fungus hæmatodes, but it is, I believe, wholly different. These cases generally get well after the operation, there is no contamination of the neighbouring parts, nor of the absorbent glands, and the surgeon need be under no apprehension of fungoid disease being established in other parts of the body. I am inclined to think the mistake has arisen from the aqueous encysted tumour having been confounded with those cysts of water or serum which are conjoined with a solid tumour of really malignant character.

Taking then the last two cases into consideration in conjunction with the several others which have been related, there can be little difficulty, I think, in coming to the conclusion that the first two cases, which seemed to present so many curious circumstances during their progress, were instances of *aqueous encysted tumours* on the surface of the liver, in which imperfect suppuration has been established, and in which peculiar actions were subsequently developed.—These cases are certainly rare in any stage of their progress, if we may judge by the little that any single person seems to know

of the subject, and the scattered notices, and confused statements, which are met with in authors.—Perhaps, therefore, the placing together a series of such cases, each of which is in some respects insulated from the rest, will illustrate all the principal facts connected with an interesting and important disease, which may be novel to some members of the Society, and therefore not undeserving of their attention.

PART II.—HYDATID ENCYSTED TUMOURS.

THE *aqueous encysted tumour* in any part of the body is very commonly spoken of as an *hydatid*, but I think very loosely and vaguely, so that two diseases which in reality are quite distinct from each other, are confounded together. The resemblance, which has given rise to this error, is the circumstance of there being in each case, in general, a cyst containing water, but it would undoubtedly be much better to confine the term *hydatid* to the parasitic animal, the *hydra hydatula* of Linnæus, which may become deposited and increase, in some mysterious way, in any part of an animal body. The *hydatid* is sometimes found in a cyst, which is most probably formed out of the adjacent parts; so that the whole tumour may thus be called an *hydatid encysted tumour*, but in other cases the *hydatids* are found without any covering, or alteration of the cellular texture of the surrounding parts; in either case, however, there is the essential difference between this disease, and the *aqueous encysted tumour*, which is made by the presence of a parasitic animal in the one case and not in the other. If there be a cyst around a quantity of *hydatids*, it is not to be considered that the cyst is an *aqueous cyst* of the kind we have formerly considered, which has no more tendency to have *hydatids* generated within it than the peritoneum has; for when *hydatids* are generated within a serous membrane, they are generally enclosed in a cyst attached to and nourished by the vessels of the serous membrane; in the same manner as, when they are generated within the liver, they are also enclosed in a cyst, which is attached to, and nourished by the vessels of the liver. But in either case, whether the *hydatid* be enclosed in a cyst, or be merely situated in a cavity in the cellular membrane of any part, the *hydatid* itself has no attachment whatever to the living substance, it is not connected by vessels with it, and the *hydatid* is nourished by imbibition only, from the secretions of the animal in which it is generated.

The confusion between the two diseases has probably arisen in part from considering the cyst, in which the *hydatid* itself is enclosed, as constituting an essential part of the disease, and as being in fact the *parent* *hydatid*, but the membrane which is nourished by vessels from the parts around, is not to be considered, I think, in any case as more than a *cyst*, and the cyst itself

with the hydatids enclosed in it may be spoken of, not improperly, as an *hydatid encysted tumour*, and the term hydatid tumour ought in no case to be applied to any tumour in which a parasitic animal is not found, nor the term hydatid to any cyst which does not possess an independent vitality.

The hydatid generated in the human body is commonly a mere globular bag, consisting of two coats, enclosing a watery or mucilaginous fluid, and if pressed out of a tumour entire, has been seen to contract, so as to alter its figure, and if broken will roll up in a manner very different to what takes place from the mere mechanical contractility of an elastic dead membrane, and it differs from the hydatid of the sheep, in which animal hydatids are so frequently found, in this respect, that the latter, the *tænia hydatigena*, has generally a mouth and neck added to its globular body, and is apparently endowed with a kind of locomotive power in addition to a vital contractility of a lower kind. I would observe, however, that the two species of hydatid are occasionally intermixed, or there is less essential difference between them than is generally imagined, for the hydatid of the sheep has sometimes no neck, and the human hydatid (Mem. of Med. Soc. of Lond., vol. ii., p. 516), has sometimes as distinct a neck, as is usually seen in those which are taken from the lower animals.*

The term hydatid is however applied still more loosely by some writers, so as to mean almost any cavity whatever; such, for instance, is nearly the sense in which it is employed by Dr. Baron in his ingenious speculations upon the origin of tuberculous diseases.

It is much to be regretted also that the term hydatid is employed indefinitely even by those writers whose experience teaches them how different the diseases are, which are frequently all spoken of together under the name of hydatids. Sir Astley Cooper, for instance, in deference to this common but erroneous practice, speaks of four different species of hydatid tumours, one of which he denominates the *animal hydatid*, to distinguish it from the other diseases to which he has given the same name; it is then to this only that the term ought to be restricted, in order to avoid those errors both in theory and practice, which have arisen from the three or four different meanings which are attached to the same word.

In the Hunterian collection the term *spurious hydatid* is employed by its great founder to describe the *aqueous encysted tumour* in the liver and other parts of the body, but this, though showing his knowledge of the different nature of the two diseases, I would also wish to discard from medical language, to avoid the possibility of misconception.

I propose in the present part of the paper, to confine myself to the *hydatid*

* For an account of the generation and increase of hydatids in the human body, see a paper by Dr. J. Hunter, in the second volume of the Transactions of a Society for the Improvement of Med. and Chir. Knowledge.

encysted tumour in the *liver*, as I did in the first part with regard to the aqueous encysted tumour,^{*} except where some peculiarity in other parts of the body will better illustrate its nature in this organ, and to place before the Society a succession of cases to illustrate the history of this disease, when it takes place in the liver, so as to complete the account of two diseases, which are probably but little known, as a very imperfect detail of them is to be found in any work with which I am acquainted.

The cyst in which the hydatids in the liver are enclosed varies in its thickness and texture, like that of the aqueous tumour, being sometimes thin and transparent, sometimes thick and firm, and at other times, in part converted into cartilaginous or osseous matter. The fluid which is secreted by the cyst of the encysted hydatid tumour differs in different cases, being sometimes thin and watery and nearly colourless, and not coagulable by heat; more frequently mucilaginous, and of a yellow or greenish yellow colour, and when the cyst has been much changed in texture, the fluid becomes quite thick and tenacious, and there is often found on its interior a quantity of greasy secretion, like butter in consistence. The number and appearance of the hydatids themselves will be found to vary very much. Sometimes there is a single large hydatid almost in contact with a thin cyst, with scarcely any secretion between its coats and the cyst itself. At other times there is a large quantity of thin fluid, in which a few globular hydatids, seldom larger than a small walnut, are seen floating, or a great number of smaller hydatids, with thick mucilage only between them of a dark colour; or again, in other cases, the cyst does not appear to have yielded proportionably to the rapid increase of these singular bodies, and the cavity is filled by a great mass of soft membranes, composed of the remains of hydatids broken down by pressure, and looking like half-dissolved isinglass. The existence of a single large hydatid is not so often observed in the liver, as it is in the breast, and some other parts of the body, and I am inclined to think that some of the cases which are called large hydatids, are really instances of aqueous encysted tumours, which have been inflamed, and from which a membrane formed in the interior, and having the shape of the cyst, has been detached subsequently.

CASE.—In the “*Journal de Medicine*,” for instance,* is described a case in which, two or three months after a blow, a tumour appeared, followed by general dropsy and ascites, and a cyst was discovered occupying the situation of the right lobe of the liver, filled by five pints of water, one pint of which, at the bottom, was a milky kind of fluid, with the remains of what is called an hydatid, broken down after having filled the cyst, and forming a mass as large as the fist. — This appears to me to have been, not an hydatid, but

* Vol. i., p. 1.

a membrane, formed in the same manner as in a case at St. George's Hospital, mentioned in the first part of this paper (see *ante*, p. 150), as having probably taken place in an aqueous encysted tumour, in consequence of inflammation. It is probable that the state of the hydatids in the liver causes a material difference in the symptoms produced by the tumour, and that the greater the quantity of fluid in proportion to the number of hydatids (*i.e.*, the more resemblance it bears to the aqueous encysted tumours), the less urgent will be the symptoms occasioned by it. It is certain, at least, that the hydatid encysted tumour is almost invariably fatal, long before the tumour has grown to anything like the enormous size which the aqueous encysted tumour is capable of attaining before it occasions the death of the patient. It would appear, however, that if the increase of the tumour is not very rapid, it may attain a considerable magnitude, without producing more inconvenience than the sense of weight and pressure, the impediment to respiration, and slight irritation of the liver, which attend the aqueous encysted tumour, and which are indicated by nearly the same symptoms; viz. the difficulty of breathing, the inability to lie in particular positions, the cough, with pain in the right shoulder, pain and tenderness in the right hypochondrium, nausea, and vomiting, and slight jaundice. So that in this comparatively innocent condition, several years may elapse before much inconvenience is experienced, till at last emaciation and general disturbance of the system, sometimes anasarca and ascites, undermine the patient's constitution, and cause his death, before the further consequences of inflammation ensue. In fact, wherever hydatids are situated, little suffering is experienced, except from the bulk of the tumour, as long as there is no great inflammation, and even then, provided an exit is afforded by the natural passages, or by ulceration, or by surgical operation, little danger need be apprehended, except in the important internal organs; and even in them the occurrence of hydatids is by no means to be regarded as invariably fatal, in which light they are looked upon by many persons; still less are hydatids to be considered as an evidence of malignant disease, though this also is an opinion which is entertained by many persons.* Hydatids, indeed, are sometimes found intermingled with malignant diseases, as they are in healthy structures, but (without entering into the supposed hydatid origin of malignant diseases generally), it will readily be conceded by any one who has seen many cases of the disease, that hydatids are often found without any of the appearances, and not followed by any of the fatal consequences of malignant diseases; it is but fair, therefore, that the circumstance of their union in the same tumour should be considered as a coincidence only, and

* See a case of hydatids in the liver, related by Dr. Blackmore, of Plymouth, in the *Medical Gazette*, vol. ix., 464.

not that the one disease is the necessary result of the other. But if there is *no* exit for the discharge of the hydatids, and especially if there takes place inflammation of the cyst, a *small* tumour becomes dangerous, and frequently fatal.—In the brain, for instance, they will necessarily be fatal at an early period, and even in the orbit, *i.e.*, near the brain, the irritation is sometimes so great as to destroy the patient.* So also in the liver the peculiar situation of the tumours may render them fatal at an earlier period than they would otherwise have been. They are usually met with, like the aqueous encysted tumour, on the anterior and convex part of the organ, or partly in its substance, in which situation a good deal of pressure can be borne with impunity, but if their situation is different to this, the symptoms will be variously modified.

CASE.—A young man was in St. George's Hospital, under the care of Dr. Young, who had for some time expectorated bile, while none whatever seemed to enter the intestinal canal, and it was found that the common biliary duct, was completely obstructed by an hydatid just at its entrance into the duodenum. A considerable cavity was also found in the right lobe of the liver, communicating freely with a still larger one in the lung, the whole being full of bile and pus with hydatids of various sizes, all however empty and flaccid except a very few.† In this case the absence of bile in the evacuations was a symptom different from what is generally observed in hydatid tumours of the liver, but jaundice did not occur; no doubt because the bile escaped by the lungs instead of being accumulated in the system.

In the following case (which occurred in the practice of Dr. Duncan of Edinburgh ‡) a different modification of the usual symptoms will be seen. A man had a tumour in the right hypochondrium with the usual symptoms which arise from an hydatid tumour, pain in the shoulder and liver, dyspnoea, cough, inability to lie or move in particular attitudes, with slight jaundice, but in six months' time the whole body was of a *deep yellow colour*, and the urine was loaded with bile while the alvine excretions were perfectly white. When in the erect posture, a large circumscribed fluctuating tumour was observed in the hypochondriac and epigastric regions which subsided immediately on his assuming the horizontal posture, when an uniform tense swelling occupied the whole abdomen. The urine diminished, while this was forming, and his legs and feet were sometimes œdematous. The hydatid encysted tumour was here found in the porta of the liver, of the size of a large orange, and the vessels passed over and were pressed upon, or rather stretched by the tumour, so as to occasion the peculiar symptoms. From the mechanical obstruction of the vena portæ and vena cava arose the ascites and œdema of the legs, and the complete closure of the biliary ducts

* See "Guthrie on the Eye," p. 167. † "Introd. to Med. Literature."

‡ *Edin. Med. Journal*, vol. iv., p. 187.

occasioned the aggravated jaundice and white stools; the liver itself was from the same cause very large and of a mottled green colour, and the water in the abdomen was as dark as the urine. The disappearance of the circumscribed tumour in this case is a circumstance that I have not observed, and which can only arise, I suppose, in cases where ascites has been induced. The means of diagnosis afforded by manual examination is not very satisfactory in the hydatid encysted tumour, unless the proportion of fluid is considerable, though sometimes the sense of fluctuation is very distinct, almost as much so perhaps, as in the case of an aqueous encysted tumour, which I mentioned in the first part of this paper, before the fluid was evacuated [see *ante*, p. 147]. In general, however, the fluctuation is less evident, so as to render it more difficult to distinguish the tumour from a solid enlargement of the liver, except by the negative signs, which arise from the absence of those other symptoms which ought to characterize a structural change of a decided character; the ascites and deep jaundice for instance which seldom arise from the hydatid tumour. It is clear, however, that as many of the symptoms in either case arise from the same cause, viz., the increased size of the organ, it will often be difficult to form a positive opinion, unless fluctuation is perceived. It has been said that there is a kind of trembling in the hydatid tumour, which differs from the sensation of mere fluid; but it is evident that the number and condition of the hydatids, and the thickness of the cyst, must materially alter the sensation communicated by the touch.

When this point is decided, and the existence of fluid is perceptible, there arises the further question, whether the fluid is formed by a chronic abscess or by hydatids. In the uninfamed state of the hydatid encysted tumour, the question can generally be answered, by the difference in the preceding history, and the absence of the usual signs of such inflammation of this organ, as could have produced an abscess, and by the non-occurrence (when the fluctuation becomes apparent) of rigors and perspiration and other symptoms of the formation of matter. Sometimes when the fluctuation is indistinct, the hydatid tumour may be distinguished from enlargement of the liver by a degree of irregularity in the tumour perceptible through the abdominal parietes, giving to a certain extent the feeling of there being several tumours more or less separate from each other. Two cases were recently in St. George's Hospital at the same time, which were believed to be hydatids of the liver, in one of which it was thought that the circumstance alluded to, was perceived.—Dr. John Hunter* has given a description of a case of this kind, in which an hydatid encysted tumour, that had its basis in the liver, proceeded downwards in the abdomen, so that it was swelled before

* "Transactions of the Society for promoting Med. and Chir. Knowledge," vol. ii.

the man's death with many irregular protuberances. Some hydatid tumours from the same situation had also made their way through the diaphragm and were in contact with the lung. Cases, however, will sometimes occur, which would probably baffle the most acute observer from their singular combinations.

CASE.—A boy received a blow by a fall upon the right side, followed by a tumour some weeks afterwards, by which he was ultimately carried off.—He was tapped two days before he died, and twelve pints of greenish water evacuated, but the upper part of the abdomen was not diminished by the loss. The liver was not much larger than natural, but contained many hydatids, not enclosed in a cyst, but set loose in the substance of the organ. The gall bladder was enormously distended so as to contain eight pounds of bile enclosed in several concentric bags formed by successive layers of lymph, and the duct was large and full of calculi. In addition to this immense tumour of bile (which is similar to a case mentioned in the first part of the paper), the spleen, which was healthy in structure, had attached to it an aqueous encysted tumour, containing six pounds of water not coagulable by heat.* The coincidence of a large aqueous cyst, with an hydatid tumour observed in this case, is not uncommon.†

The origin of the hydatid, as well as of the aqueous encysted tumour, from a blow or injury, is another circumstance, which is very frequently found to have been the case in the human subject, whatever else may be the cause of its prevailing so extensively in certain seasons in sheep. Another singular circumstance in the history of hydatid encysted tumours is the appearance of several such tumours in succession in different parts of the body. The most remarkable case of this kind which I have met with, is related by Mr. Hill of Dumfries.‡

CASE.—A little girl received a hurt on the side by a fall from a horse, which was succeeded by a tumour of the liver containing hydatids, the circumstances of which I shall afterwards have occasion to allude to. This tumour being quite well, there appeared thirteen years afterwards three large tumours on different parts of the abdomen, which seemed to be seated no deeper than the muscles, and were attended with a good deal of fever and pain. At last one of them, situated between the ribs and the spine of the ilium of the left side broke into the intestines, discharging a great number of hydatids with much blood and pus by stool. The others broke outwardly, and for three or four years afterwards, at different periods, tumours appeared on several parts of the abdomen, from all of which hydatids were discharged. Notwithstanding which, however, the patient ultimately recovered. [See *postea*, p. 166.]

* "Edin. Essays and Observations," vol. ii., p. 352.

† See "Transactions of the Society for promoting Med. and Chir. Knowledge," vol. ii.

‡ "Med. Comment.," vol. ii., p. 303.

This fact led Mr. Hill, in a remarkable case of the kind, to inquire whether some people might not have an hydatid constitution, as others have a scrofulous one. Dr. Hunter endeavoured to explain the same fact in a different way, by supposing that hydatids might escape from tumours in the liver or spleen, in which organs they are so frequent, and drop down to some other part of the abdomen and pelvis, and increase there. It would appear then, from what I have advanced, that an hydatid encysted tumour will, in general, produce more pain and irritation of the liver and lungs than an aqueous encysted tumour, so that a fluctuating tumour in the liver, wholly without pain, would be more likely to be of the latter than the former kind; the diagnosis, however, is of less consequence, than between either of these tumours and other diseases of the liver, which may however in most cases be distinguished by careful examination from the two species of encysted tumour.

Is an hydatid encysted tumour, in an *uninflamed state*, to be opened, so as to evacuate its contents, in order to prevent further consequences? This is an operation which has sometimes, but not often, been done, and occasionally with success; but it is probable that more severe inflammation would generally take place than from opening an aqueous encysted tumour, the tumour itself being more disposed to inflame, and a larger opening, with probably more violence, being sometimes necessary than for the evacuation of simple water. I should therefore not be disposed to perform the operation, unless the tumour was of considerable size, and produced much inconvenience or irritation; but rather to wait till it became from these circumstances, or from suppuration, more decidedly necessary. I have not seen the operation, however, performed till after suppuration had been established, but if the symptoms, from pressure, should become urgent, there seems no reason why the operation should not succeed in the same way as when it is done in other parts of the body; allowing for the greater danger of a suppurating cavity connected with the liver.—I say a *suppurating* cavity, for if we may judge by the usual course of hydatid tumours in other parts of the body, we may reasonably expect that although the opening in the parietes may close, yet the cavity itself will not be so likely to become obliterated, as in the aqueous encysted tumour, for instance.

CASE.—The operation is described as having been performed by M. Recamier in an uninflamed hydatid tumour of the liver, by which, on two successive days, about a pint and a half of serosity, slightly turbid, escaped. The patient, however, still suffered pain: a month afterwards, a fresh puncture was made, and a fluid of the most foetid odour escaped with a quantity of hydatids; the cavity was subsequently injected and contracted, and the

patient was probably cured.* Unless, therefore, the tumour was very large, or the health was much disturbed by it, or the local symptoms were severe, the danger would probably not be much increased by waiting till suppuration had been established, since suppuration, probably, would not be prevented by an earlier opening ; still, however, the question would require consideration, for there is the same danger of rupture of the cyst, as with the aqueous encysted tumour.

CASE.—A young girl had a tumour evidently situated in the liver, but its nature was not clear. One day, in consequence of exertion, she suddenly felt an acute pain, the tumour disappeared, but the lower part of the abdomen became tumefied, and fluctuation was very perceptible. M. Roux made an incision, which gave vent to a transparent straw-coloured fluid, in which a great number of hydatids were floating. The patient died soon afterwards, and on opening the abdomen, many more were found in the cavity of the peritoneum, and in the liver was an enormous cyst which had been ruptured.†

Mr. Annesley mentions a case in his practice, in which a similar fatal event took place.‡

In the *Medical Gazette*§ is an account of a case in which, in consequence of a fit of passion, a *single* hydatid was disengaged from its bed below the pleura, and the same fatal result ensued. Undoubtedly, however, when symptoms of suppuration have occurred, or there is such a degree of irritation and suffering as to render suppuration probable, or the patient's life is endangered by pressure only, an operation is called for.—The symptoms of suppuration in the hydatid tumour in the liver will generally present the same difference, from those of a simple abscess in this organ, which I pointed out when speaking of the inflammation and suppuration of the aqueous tumour, so that a careful attention to the previous history of the case, and the local appearances and state of the system at the time, will at least create a strong suspicion of the nature of the disease.

CASE.—A woman was admitted into St. George's Hospital under the care of Dr. Hewett, with a tumour apparently attached to the liver, and containing fluid. The patient, however, had such a modification of the usual symptoms of abscess, that Dr. Hewett believed the tumour contained hydatids. She was kept quiet a short time with the view of procuring adhesion of the suppurating tumour to the abdominal muscles, after which it was punctured with a trocar by the late Mr. Rosc. There was discharged through the canula a wash-hand-basin full of broken down hydatids mixed with thick yellowish green watery pus. The woman, however, experienced only temporary relief, and died shortly afterwards. I have seen exactly the same kind of fluid in other cases in which suppuration has taken place in

* *Medical Gazette*, vol. ii., p. 573. † *Medical Gazette*, vol. i., p. 771.

‡ "On the Diseases of India," § Vol. i., p. 325.

hydatid encysted tumours of the liver, and it bears so much resemblance to the fluid evacuated in the two cases of abscess related in the first part of this paper, as to add strength to the supposition of the peculiar matter in those instances having been also derived from a membranous cyst. Sometimes, however, the tumour itself bursts externally and gives exit to its contents, and the patients now and then have got well. This took place by ulceration in the case I have quoted from Mr. Hill, and spontaneous openings seem to have formed in each of the other hydatid tumours which afterwards appeared. Guattani mentions an instance in which, instead of ulcerating, the skin, which was much attenuated, appears to have literally burst during one of the fits of coughing, and through a small opening, like a crow-quill, above 300 hydatids were thrown out to a considerable distance. The opening remained fistulous, discharging a little serosity, and then healed six years afterwards. Next to the formation of an external opening on the surface of the abdomen, the establishment of a communication between the cyst and the interior of the colon is the most favourable circumstance when suppuration occurs. I am indebted to Mr. Keate for the following case.

CASE.—A gentleman had constant pain in the epigastrium and other symptoms of dyspepsia, the cause of which was not apparent for several years, at the expiration of which time his health was so much impaired, that he was exceedingly emaciated, and his life was despaired of. He suddenly felt, after an exertion, an inclination to evacuate the contents of the bowels, and began to discharge an immense quantity of watery fluid with what he termed portions of flesh, but which proved to be hydatids. One vessel after another was thus filled, till it was supposed that near two gallons must have been discharged. After this his health was restored, and he still remains well ;—several years having now elapsed.

CASE.—An equally fortunate result took place in a lady, who was attended by Dr. Seymour, whose life seemed in imminent danger from an enlargement in the situation of the liver. Instead of a sudden rupture, however, hydatids were discharged by the bowels for a considerable time, during which the tumour gradually disappeared, the constitutional symptoms subsided, and she has remained free from complaint for several years. I conclude that the tumour in these two cases ulcerated into the *colon*, from the hydatid being discharged *only* by stool ; but the cavity will sometimes communicate with the *duodenum*, in which case an additional symptom occurs, the hydatid being *vomited* as well as got rid of by the bowels, which circumstance is, probably, attended with greater danger than if the tumour merely ulcerates into the lower and less important part of the alimentary canal.

CASE.—A case of this kind is related by Dr. Blackmore of Plymouth,* in

* *Medical Gazette*, vol. ix., p. 466.

which after several years suffering from symptoms of impaired energy of the stomach, with one attack of jaundice, a woman was seized with inflammatory symptoms with a return of jaundice, and after a month's illness there occurred violent vomiting of hydatids with purging of the same substance and much prostration of strength; the vomiting and purging returned several times at intervals of a few days, after which she continued to evacuate some more hydatids with less urgent symptoms, till her death occurred, a month after the cyst had burst. A large cavity was found connected with the posterior part of the right lobe of the liver; it was lined with lymph, and contained about a pint of bilious ichor, mixed with coagula of blood, but emptied of the hydatids which it previously contained. This cavity had ulcerated into the duodenum by an opening half an inch in diameter, and the small intestines to some extent were vascular and thickened. There appears also in this case to have been another effect of the irritation of the hydatid encysted tumour upon the structure of the liver, which sometimes, though not very frequently, takes place. In the right lobe of the liver, near the tumour, were some scattered scrofulous abscesses, none of which were larger than a pea; in a similar case, however, in which the hydatids were discharged by vomiting and purging and by the lungs, from a large sac of hydatids connected with the spleen, which had also been opened from the abdomen, a large foetid abscess occupied both lobes of the liver.* In the case I have just quoted, the combination of an hydatid encysted tumour of the spleen, with a large abscess in the liver is remarkable, but I will not enter into speculations concerning their probable connection with each other. It will be right, however, to observe that when an abscess in the liver co-exists with an hydatid tumour, or has been produced by it, an instance of which I have seen, the danger of the case must be infinitely greater, and the diagnosis very much more difficult, since there will now be added to the usual symptoms of such a tumour, those of inflammation of the substance of the liver, and those indications of suppuration which are usually absent or scarcely apparent in the common suppuration of the hydatid cyst. Instead of ulcerating into the intestinal canal, an hydatid encysted tumour of the liver sometimes makes its way through the diaphragm into the lungs, and the hydatids are discharged by coughing. In the Medical Transactions,† is a case of this kind in which hydatids of various sizes, from that of a pea to that of a pullet's egg, were thus coughed up for several months, the hydatids having sometimes appeared to obstruct the air-vessels, so as to produce the most urgent symptoms of impending suffocation. In the first part of this paper, I related a case in which an aqueous encysted tumour appeared to have communicated in the same way with the lungs, but it is remarkable that no case of this kind appears to have ulcerated into the intestines, which

* *Edin. Med. and Surg. Journal*, vol. xv., p. 51. † Vol. ii., p. 486.

the hydatid tumour frequently does. It would seem desirable, when the tumour has thus ulcerated into the thorax, to procure an opening, if possible, through the abdomen, in order that a direct opening into the cyst might enable the hydatids to come away more freely; the danger of a large and circuitous exit in which two important organs at once participate, being thus got rid of, and the healing of the sinuses through the lungs facilitated. This result took place in the interesting case of Mr. Hill's, which I have already alluded to, the disease having lasted eleven years in the liver, and hydatid tumours being formed in the abdomen thirteen years after that in the liver had been cured. It is scarcely to be expected, however, if the original tumour is so situated as to make its way through the thorax in preference to an external opening, that an opportunity would often be afforded, however desirable it may be, to make an external, *i.e.*, a depending opening, through the abdominal muscles, in order to heal the more dangerous one through the lungs; nor, indeed, is it to be expected, with so much mischief among so many important organs, that, if the surgeon could do so, the patient would have strength of constitution to subdue the disease, except in some rare cases.

CASE.—A woman was under the care of Dr. Billing at the London Hospital, who died under these circumstances; an external opening, discharging hydatids, having formed naturally in the abdomen, after she had for some time expectorated hydatids through the lungs. The liver extended almost into the pelvis, an encysted hydatid tumour of the size of the fist being situated at its under part, and being entire; while the gall-bladder formed another tumour stuffed with dead hydatids, and it was from this cavity of the gall-bladder that an opening of the size of the finger led upwards through the diaphragm into the bronchial tubes, in addition to another opening from the same tumour through the abdominal parietes. This circumstance of the formation of an hydatid tumour within the gall-bladder, or within its cavity, instead of in a cyst formed expressly for their reception, I have not heard of in any other case; it is possible, however, that there is some error in the account, and that the hydatids had really made their way out of a cyst in the liver by ulceration into the gall-bladder, as in the case already related, of Dr. Young's. In Dr. Billing's case, however, there was no obstruction to the course of the bile into the duodenum, as there was in the other instance.*

It will be seen from the preceding statement, that, while there is, in some respects, a great similarity in the course of the two kinds of encysted tumours of the liver, they yet differ from each other materially, not only in their origin, but in many points during their whole course, the hydatid encysted tumour being, however, on the whole, more dangerous than the aqueous,

* *Medical Gazette*, vol. vii., p. 542.

though both of them are frequently fatal. I am not acquainted with any fact which establishes the occurrence of unhealthy and fungous ulceration after an hydatid encysted tumour of the liver, similar to the cases which I related, in which I believed that this process had taken place in the aqueous encysted tumour. It is very possible, however, that they may resemble one another in this respect also, since there is no doubt that unhealthy ulcers, which are sometimes called malignant, are now and then formed, after hydatid tumours in other parts of the body have been opened, especially if there is a small opening into the cyst, which contains the hydatid, or if the cyst has been irritated by passing a seton through it; the appearance, in fact, resembling a similar change, which is sometimes seen in bursal encysted tumours.

I shall not occupy the time of the Society in describing what I suppose may be the proper medical treatment of the curious encysted tumours, the course of which I have endeavoured to describe; for I conclude the cure of them must be conducted on those general principles only, which guide us in other diseases, and that in each case, as particular symptoms arise, those must be combated. I will venture to observe, however, that I think too much care has been directed in many of these cases, to what has been imagined to be inflammation of the liver, when, in reality it did not exist to the extent supposed. The symptoms throughout the whole course of the complaints, are rather those of pressure and irritation, than of actual inflammation, and the acute pain, which arises from this pressure, is not to be considered as entirely inflammatory; in fact, in many cases the slowness of the pulse sufficiently points out this circumstance: but even when there is a quick pulse and hot skin, there is debility, hectic and irritative fever, and not a sthenic diathesis, the tongue remains moist and clean with great rapidity of the circulation, or is covered with brown sordes; and consequently, general depletion and extended mercurial courses, on the supposition of inflammation being present, will only hasten the patient's death. The progress of the disease may be materially checked however. A case lately occurred in St. George's Hospital, in which the tumour was much lessened, and ascites and other symptoms got rid of, for a time, by the use of iodine. The disease was ultimately fatal nearly a year after. It is obvious, however, that as with regard to encysted tumours of the same kind elsewhere, medical treatment can only be directed to the palliation of the symptoms successively produced by the growth of the tumour, or by its own efforts to effect a cure; and that as the extirpation of the tumour is out of the question, the only effectual cure consists of the surgical means by which the obliteration of the cyst can be effected, *i.e.*, by causing adhesion of the parietes of the cyst by lymph, with or without suppuration, and sometimes also by granulation,

or by the destruction of the cyst, all of which methods are employed for the cure or removal of encysted tumours of the same kind in other parts of the body. Perhaps, therefore, I may be allowed to make a few remarks upon the important question of the mode in which the contents of the cyst should be evacuated, which is a necessary preliminary step, and upon what should be done subsequently; the cases in which the operation is called for having already been alluded to.

1. With regard to the treatment of the aqueous encysted tumour, I think it quite clear from the successful cases, which I have formerly related, that the best method of proceeding when they contain water, or water with a little serum, or lymph, *i.e.*, when they are nearly uninflamed, and the cysts are thin and membranous, is to puncture them with a trocar, taking care that no undue pressure is employed, which might induce too much inflammation, and that moderate pressure is continued during the whole time the fluid continues to flow, as well as when the canula is withdrawn, so that no air can enter the sac. If, therefore, the contraction of the abdominal muscles and diaphragm does not seem to empty the cyst readily, the use of a cupping-glass over the canula, is a better method of proceeding than using undue force with the hands.—The great object, after the evacuation, is to heal the puncture, which readily takes place, and to keep the sides of the cyst in contact by pressure, which may be done by means of long straps of adhesive plaister round the abdomen, and a moderately tight bandage.

2. If *suppuration* has taken place, I should be inclined to adopt the same means, which I employed in the first case, related in the beginning of the paper. That is to say, to puncture the abscess in the same manner with the trocar, through which a gum catheter may be introduced to give exit to the fluid, that may be subsequently evacuated; after the puncture, pressure may be employed by the side of the catheter, to produce as much diminution of the size of the cyst, as the degree of the inflammation present in the case will allow. An objection is made by some persons to the employment of a cutting instrument in abscesses of the liver, lest there should not have been such a degree of adhesion between the covering of the abscess and the abdominal parietics, as to prevent the passage of some of the contents of the abscess into the peritoneal cavity; and hence, if there is not obvious adhesion, they employ caustic potash to open the cavity, instead of a surgical instrument. It is clear that if such a method is right in cases of common abscess, it must be doubly so in the abscess in a cyst, as there is usually much less adhesion than attends suppuration in cellular membrane.—I cannot, however, see the propriety or advantage of adopting this proceeding in opening any tumour containing fluid in the liver or other part of the abdomen. The only case which occurs to my recollection, as having been, perhaps, attended with peritonitis subsequent to the opening of an abscess, is

one related by Dr. Graves.* In this case excruciating pains came on, three hours after a few ounces of pus escaped from an abscess in the liver, and the patient died twenty-seven days afterwards. In this instance, however, caustic *was* applied, and a small cut was made after the separation of the slough, in the deeper parts, which had not been destroyed; and there is further, I think, no proof whatever that the peritonitis was occasioned by the escape of pus into the peritoneum, nor, indeed, of there having been peritonitis at all at that time, for neither pus nor any other kind of fluid was found in the cavity, and the abscess still held upwards of four pints of purulent fluid. The inflammation sometimes consequent upon opening an abscess of this magnitude, is quite sufficient to account for the symptoms resembling peritonitis, without supposing that it arose from escape of pus into the cavity of the peritoneum; and in another case related by the same gentleman, even the opening the gall-bladder by mistake, produced no inflammation, and therefore, I conclude, no effusion into the peritoneum.

I have related several cases in which a simple puncture of an uninflamed, and therefore, probably an unadherent *aqueous* tumour, did perfectly well, and in which a puncture with a lancet answered the purpose; at all events, the use of the trocar which I employed in the first instance in my own case of abscess, is not, I presume, more likely to be attended with effusion into the peritoneum, than the puncture of the bladder is likely to be followed by escape of the urine into the cellular texture, since there is in the latter case the contraction of the bladder to add to the probability of effusion. The catheter may also be withdrawn with impunity after a day or two, when the parts are consolidated by adhesion, as it may be when the bladder is punctured above the pubes.

Another method is recommended in a paper of Dr. Graves's, in order to obviate this, I think, imaginary danger, viz. the making an incision through *part* of the abdominal parietes, leaving the remainder to be opened by ulceration. If fluctuation is evident, however, I cannot conceive there is any necessity for this dilatory proceeding, but in doubtful cases, an instance is related, which seems to show that it may serve the purpose of directing, in some measure, the course of the ulceration.

3. I conceive the same plan is best, if it is determined to open an *hydatid* encysted tumour, whether in a simple or in an inflamed state, unless the previous confinement of the contents of the cyst had so much disturbed the health, or the contents were so decidedly purulent, as to make a larger opening at once necessary. It might be thought, perhaps, that with these bodies, the orifice made by the trocar would not be sufficient to give exit to them, but their figure becomes so altered, or they are so readily broken down

* "Dublin Hospital Reports," vol. vi.

and burst, that they will pass through a very small opening. I have mentioned a case, in which, when spontaneously ruptured, and nearly uninflamed, more than 300 hydatids were propelled with considerable force, through an opening which is described as having been not larger than a crow-quill; and when in the state of abscess, in Dr. Hewett's case, a whole wash-hand basin of broken down hydatids and pus came away through the canula very readily. Cases in which a complete incision with the knife has been made at once, do not seem, on the whole, to have been so successful, as when a smaller opening has been employed, which can be enlarged subsequently, if it is found insufficient, with less risk of opening the peritoneal cavity, than if the same sized opening be made at once. If a large opening be made at once and kept open, there is necessarily a suppurating cavity, which, in so important an organ as the liver, is, of course not a little dangerous, while, if there is no inflammation, there is sometimes a chance, though a small one, of procuring adhesion after the puncture, in the same way as it generally occurs, if an aqueous encysted tumour is punctured. If, therefore, the character of the fluid mixed with the hydatids is not purulent, little risk is run, I imagine, by attempting to procure this obliteration by adhesion; and if this fails, the puncture can readily be reopened.

4. If the fluid, however, be at all purulent, the propriety of attempting wholly to close the orifice is much more doubtful, and it will probably be less hazardous to leave it open, lest dangerous symptoms should be produced by confinement of matter become foul by the opening. Even now, however, when in part purulent, I am inclined to think the orifice should be at first small, as I have before recommended, for the following reason. It must be recollected that the cyst of hydatid, like that of aqueous encysted tumours, partakes more or less of the nature of a serous membrane; it is, like the natural serous membrane, indisposed to secrete pus, when inflamed, and if any purulent secretion is found, it is mixed with lymph and with much of the aqueous and mucilaginous fluids that are secreted in the uninflamed condition. The pus is still formed by the vessels of the cyst, not by granulations as in the cyst of an abscess; the cavity, therefore, does not fill up by granulation at all readily, but the sides still remain more or less disposed to adhere by lymph if they are kept in contact by such pressure as can safely be employed. Provided, therefore, the centre be open, and the symptoms carefully watched, it is, I conceive, right to diminish the size of the cavity as much as possible by adhesion, and not at once, to encourage suppuration throughout the whole cyst by allowing a free access of air by means of a large opening.

To show to what extent adhesion may be procured in an hydatid encysted tumour, I may refer to a case which occurred in the practice of the father of

a former pupil of mine, Mr. Attenburrow, of Nottingham, whose character as a skilful surgeon was not belied by his diagnosis of the case.—A girl about fourteen, fell down stairs, and a month afterwards a swelling formed in the thigh, which increased without pain or disturbance of the health, till in ten month's time the length of the tumour from the pubes downwards was twelve inches, its breadth nineteen, and its circumference at the base thirty-three inches. A large trocar was passed into the tumour, and a quantity of dark coloured matter evacuated, the stream being occasionally interrupted by large portions of broken down hydatids. Strong pressure was applied, and several times the bursting of an hydatid was felt, which was invariably succeeded by a stream of clear serum, which was again followed by hydatid cysts and purulent fluid. Seven pints were thus evacuated, after which pressure was applied. About three weeks afterwards a pint and a half of purulent fluid was let out, which was attended with some fever. Pressure was again applied, and there seemed to be no further return of the swelling.* Had so large a cavity been freely opened, instead of attempting to procure adhesion, under such apparently unlikely circumstances, the result of the case would probably have been very different.

5. There is only one other circumstance which I will allude to, with regard to the treatment of these cases, which is, that when an hydatid encysted tumour has been opened spontaneously, or by art, much good appears in many cases to have been derived, when the discharge has put on an unhealthy character, from washing out the cavity with warm water, or by injecting into it some gently stimulating applications, some short time after the first opening had been made. This practice seems to induce a more healthy secretion in the cyst, and to facilitate the adhesion of the sides by lymph, and is not followed by inflammation to a hurtful extent, if proper care be taken.

[*Med. Chir. Trans.*, vol. xviii., p. 98.

CASE OF AQUEOUS ENCYSTED TUMOUR OF THE KIDNEY,

WITH A SUPERNUMERARY GLAND ATTACHED TO IT.

READ MAY 28TH, 1833.

IN a paper which I presented to the notice of the Society, in the early part of this season, I gave an account of some cases of tumours connected with the liver, which I called *aqueous encysted tumours* of that organ; and among other peculiarities of this disease, I mentioned the nature of the fluid which they contain, which is water only without any albumen or other animal

* *Med. Gazette*, vol. vi.

matter, except a little of what Dr. Marcet has called *mucæ-extractive matter*. In speaking of the impropriety of the term *serous cyst*, as applied to these tumours, I observed that I had punctured a tumour apparently connected with the kidney, which I believed to be an instance of an *aqueous encysted tumour* of that organ, because the fluid which was evacuated was of the same kind as that which these tumours usually contain. An opportunity has since been afforded of verifying this observation by the death of the patient; and as the growth of the aqueous encysted tumour of the kidney to such a size as to constitute a disease, perceptible during life, is as far as I know, still more rare than the same disease in the liver, the relation of this case may, perhaps, not be uninteresting to the Society, as a sequel to my former paper, the contents of which appeared to be new to many of the members.

John Connell, æt. 6, was admitted October 18th, 1832, into St. George's Hospital under the care of Dr. Seymour, with enlargement of the abdomen, and shortly afterwards his mother having given an obscure account of his having received some injury, I was desired to see him.

It appeared from the mother's account, and from a letter written by the medical man who had first seen him after the injury, that three weeks before his admission he had been struck down, and perhaps run over by a carriage, which produced great pain in the abdomen, with considerable swelling, in consequence, as this gentleman supposed, of inflammation of the colon;—that the swelling had almost all subsided four or five days afterwards, when the bowels had, with great difficulty, been acted upon, and that ten days after the injury a swelling again slowly appeared without much pain, but which was now confined to the right side of the abdomen instead of having been general; and that having been previously a stout healthy child, he had since that time become emaciated, and had suffered from feverishness, with occasional pain in the tumour.

The whole abdomen seemed large and distended, but especially the right side, which was tense and firm, and occupied by a tumour which extended from the right hypochondrium to the right iliac region, and from the back of the loins to a little beyond the linea alba, the ribs and ensiform cartilage being considerably pushed upwards by the bulk of the swelling. The intestines were pushed across to the left side, or covered by the tumour, for no sound of air could be detected below the swelling, though it seemed as if deep pressure enabled the edge of the liver to be felt by the finger. The tumour evidently contained fluid, fluctuation being clearly felt by the fingers being placed laterally, but more obscurely from above downwards, and it seemed as if the fluid was divided into two portions by a line running obliquely across the abdomen, just below the umbilicus. The tumour did not seem to be very painful, but the child complained of pain occasionally, and pressure gave some pain at the lower part of the abdomen. The child did

not suffer from much fever, but the pulse was rather quick and feeble, and the tongue white. The bowels were constipated, requiring the frequent use of castor oil, and the evacuations were light-coloured. The urine was passed freely, but was rather scanty in quantity, and was healthy in quality.

What then was the nature of this tumour? Was it an abscess in the iliac fossa and among the abdominal muscles, produced by the blow? This did not appear probable to me from the absence of perspiration and of rigors, the slight pain and tenderness, and the symptoms of *irritation*, rather than of *fever*, which were present in the case. Was it a deposition of serum and lymph, or of pus in the peritoneum, in consequence of the inflammation supposed by his first medical attendant to have taken place in the colon? This is not indeed a very common circumstance, but yet on the whole, after hearing the opinions of our colleagues and of many other gentlemen who saw the case, it seemed to Dr. Seymour and myself to be the most probable cause of the swelling. What seemed to make this opinion likely was the abrupt line, which was felt where the tumour and the intestines on the left side joined, and the crackling sensation which was there felt, as if by the deposit of lymph at the margin of the cavity.

The child was directed to take castor oil every other morning, to take one grain of calomel three times in the day, and to have ten leeches applied to the swelling, with fomentations.

Nov. 7th, about three weeks after his admission, the irritation of the system had much subsided, and all pain and tenderness had ceased, and the boundary line of the cavity seemed to be nearer to the right side, as if the fluid had diminished, and it seemed now to be in one cavity, the apparent division being no longer perceptible. A better diet was allowed, but the calomel was continued, with the castor oil.

13th.—Some pain being felt, eight leeches were repeated, and the calomel, with four grains of Dover's powder, was given twice a day, instead of three times.

22nd.—Leeches repeated in consequence of pain, and beef-tea given instead of meat.

By this time the swelling had much diminished, so that the boundary was felt about half an inch to the right of the umbilicus, instead of going beyond it, and the tension was lessened. The health had by this time much improved, the bowels were more regular, the appetite good, and the child was cheerful and free from pain or anxiety.

24th.—The calomel was omitted, and the abdomen was ordered to be rubbed with an ointment composed of equal parts of mercurial or iodine ointments.

Very soon after this a marked change for the worse took place, fever returned Nov. 28th, with sickness, for which effervescing saline mixture was directed.

December 1st.—Great pain and tenderness of the whole abdomen came on, as if there was general peritonitis, and the fluid in the tumour rapidly increased again, and it became very tense and painful. The child lay with his legs drawn up, and was unable to bear them to be laid down, and the countenance assumed an expression of great suffering, with slight inflammatory fever.

Twelve leeches were applied in the morning, and again in the evening, and in the middle of the day I made a small puncture into the tumour on the right side, through the abdominal muscles, and let out 18 oz. of clear fluid, nearly transparent, which evaporated almost entirely, leaving a small residuum of muco-extractive matter, without any trace of albumen. The evacuation of this fluid afforded very great relief, but our views of the nature of the disease were materially changed. It seemed evident upon consideration of the nature of the fluid, that it had not been formed by the peritoneum, but was contained *in a cyst*, for the reasons mentioned in my former paper, when I alluded to this case.

Was it then an *aqueous encysted tumour* of the liver, such as I was then speaking of?—Or was it an aqueous encysted tumour of the kidney?—Or was the fluid contained in a cyst connected with fungus hæmatodes of the kidney?

This latter opinion became in a short time the general one, for it seemed as if after the evacuation of the fluid, a solid tumour could be felt in the loins, which indeed was subsequently found to be the right kidney, though not enlarged, as it appeared to be from its having become more moveable, and the countenance soon put on that sallow and emaciated appearance, which so often attends malignant disease; and besides, fungus hæmatodes of the kidney is more common than the aqueous encysted tumour of the kidney or liver, enlarged to such a size as to produce the symptoms observed in this case.—The urine was indeed healthy for the most part in its quality, but so it often is in fungus hæmatodes of the kidney, till the tumour softens, and discharges blood, or pus, or the nature of the secreted fluid is otherwise altered. We had observed, however, an unusual scarcity of urine at the first inspection of the case, which was not noticed during the temporary amendment of the patient, but was now again remarked; and several times before the child's death I observed that the urine contained a considerable quantity of sulphuretted hydrogen, which tarnished silver, and was evident to the smell, though the urine was clear, and sufficiently acid, to be considered in other respects healthy. Adopting this view of the case as the most probable, the fluid was not again evacuated, which I now much regret, as it might have afforded some relief to the boy, though it is not likely to have saved his life.

The amendment, however, occasioned by the evacuation was so temporary,

that it did not seem to be again called for, especially after the supposed existence of solid tumour. The pain soon returned, the child rapidly fell away, in a week the swelling was as large as before the operation, extreme restlessness took place, with starting and screaming in his sleep; convulsions were once observed, and the child could not bear to be touched or looked at. The tumour went on increasing to a great degree, and the child lingered in a state of great suffering till December 25th, when he died.

On examination after death the tumour was found to consist of a single cyst, containing about five pints of fluid, the greater part of which was clear and transparent, like that which had been previously evacuated, and, like it, did not coagulate at all on the application of heat; the remainder contained a good deal of the white semi-purulent matter which is usually seen in serous membranes, or in cysts, which have been inflamed. The cyst was tolerably firm in front, but towards the back and inner part, it was so thin and soft, as to tear with facility, and scarcely to allow of being dissected out. The cyst had protruded slightly below Poupart's ligament through the femoral ring, and reached upwards to the liver, raising the ribs, and pushing the liver towards the left side and into the chest; the other viscera were pushed to the left side of the abdomen, and the cyst was on that side covered by the peritoneum belonging to the colon;—in front it was adherent to the inner surface of the abdominal muscles, and behind to the iliacus internus and psoas muscles, and to the side of the lumbar vertebræ, where it was thinnest. It thus occupied the whole of the right half of the abdomen and iliac fossa, and encroached a little upon the pelvis, being external to the peritoneum. On the inside and towards the fore part of the cyst was seen the ureter, which was traced upwards, between the layers of which the cyst was composed, towards the right kidney which was situated at the back part of the cyst towards its upper and inner part. The ureter was tortuous and elongated, so as to make it difficult to trace its course, but it entered the kidney in the usual way, and was of its common size, and had no communication with the cyst; but there were two small orifices in the pelvis of the kidney, which seemed to have been the result of ulceration, and near these orifices the ureter and pelvis of the kidney were of a black colour, and tarnished the probe, as sulphuretted hydrogen does. The kidney was of the usual size, and healthy, and its anterior surface formed as it were a part of the cyst, as the cyst was intimately connected with the margins of the organ, and could not be traced over its surface; and the surface of the kidney, which was thus seen in the interior of the cyst, was flattened, and rough, and the covering thicker than usual. About five inches from the kidney towards the inner part of the cyst, was a small body, about the size of a walnut, which projected into the cyst, and was soft and lacerable, and covered by a very thin coat; this body proved on examination to be a *third kidney*, consisting

of a single lobe, with the cortical and tubular part perfect, and having a single mammillary process, and calyx, but no excretory duct could be traced. All the other viscera were healthy.

Such then was the appearance of this curious cyst, and the question presents itself, what was its first formation?

1stly. It was conjectured that it might be a cyst formed by laceration of the kidney in consequence of the blow, the smaller body being the lacerated portion separated from the rest of the organ by the growth of a cavity containing urine. The small kidney was, however, too perfect, and the original one too smooth and uniform in its shape and size, and in its external and internal structure to allow of this supposition. The small body was in fact a third kidney, such as is sometimes found, and perhaps secreted urine, which was carried off by a duct which escaped our observation, or was destroyed by the growth of the cyst. It exactly corresponded with the general form of these supernumerary kidneys.—Geoffroy de St. Hilaire says, “Les reins surnuméraires n'étaient évidemment que *des lobules* des reins normaux, restes distinct de la masse de ces organes. En un mot il-y-avait scission, et non multiplication des reins.”

2ndly. The nature of the fluid served also to show that the cyst could not have been formed by laceration of the right kidney by accident, nor yet by the gradual accumulation of urine secreted by the separate lobule in consequence of its having no excretory duct. The fluid was not urinous at all, either when drawn off during life or collected in still larger quantity before death, and (with the addition of the result of inflammatory action) its nature was the same after death, as when I let it out during life. It had indeed after death a strong animal smell, which induced some gentlemen to suppose that it at least contained some urine, but the urine in the bladder was very different in its nature, and was healthy and clear, and free from any admixture with the purulent secretion of the cyst; the fluid in the cyst was also alkaline, and ammoniacal; the urine was acid. To be certain with regard to the nature of the fluid, I requested Dr. Prout to examine some of it, comparing it with the urine of the bladder, and he was kind enough to send me the following result of his analysis.

DEAR SIR,

The fluid from the cyst is *serous*, and after a careful examination, I have not succeeded in detecting anything urinary in it; at least, if it contains urine, the quantity, I am satisfied, must be very minute.

Yours truly,

Sackville Street, 30 Dec.

W. PROUT.

This analysis will serve to show not only that the contents of the cyst were not urinary in their origin, but also that the small communication before

alluded to between the pelvis of the kidney and the cyst, had not allowed any urine to pass into the cyst, but that the orifice was more probably the result of ulceration induced by the pressure of the cyst, in order to allow of the escape of some of the fluid into the nearest tube.

3rdly. I am induced, therefore, on the whole, to have little doubt that the cyst was an *aqueous encysted tumour* of the kidney, similar to those which I have described as enlarging so greatly in the liver. It is curious, indeed, that while I was enabled to mention to the Society a great number of cases of this kind in the liver, besides those which I had myself seen, I have not met with one satisfactory case on record of the same disease in the kidney, although almost every one must have seen these cysts in this organ, when of small size, and unsuspected during life, from their having caused no symptoms of disease. Even Morgagni has only, I believe, an account of one such cyst, and that contained a few ounces of fluid only, and had not been detected during the life of the patient.—There are, indeed, many accounts of what are called curious cases of cysts connected with the kidney, but some of these were instances of mere distension of the coats of the kidney, and of the excretory vessels, with which every one is familiar, and some of them are actually ovarian tumours, erroneously supposed to have originated in the kidney.*

But although I am acquainted with no history like the one I have related, these cysts must not unfrequently enlarge to a considerable size. In the collection, for instance, of the College of Surgeons, are several tumours of the kind connected with the kidney, which have precisely the same appearance, as in that which I have detailed to the Society. They are connected in the same way with the convex part of the organ, which is flattened, and its coats condensed in a similar manner. They are, for the most part small, from the size of a pea or nut, to a size sufficient to hold several ounces, and one appears to have been large enough to have held two pints, and it seems to have been originally formed of two cysts, by an imperfect division being still seen in the interior of the cyst. Unfortunately, however, no account of the case has been preserved.

These *aqueous encysted tumours* of the kidney are called in the catalogue of the museum of the College by the same name which was given by Mr. Hunter to the similar cyst in the liver, viz., *spurious hydatids*. I need not repeat my objection to the term, as I dare say many of my hearers are acquainted with the more common characters of *hydatid tumours* of the kidney, these animals being not unfrequently discharged with the urine in vast numbers, and for a great length of time, and the disease being sometimes

* See "Miscell. Acad. Nat. Curios." Dec. 1, Ann. 1, 1670, p. 133. "Novi Comment. Gotting," T. 8, p. 10. "Bulletins de l'Ecole de Medicine" Ann. 1811, p. 185, &c. &c.

entirely cured, so that although I have seen the disease occasionally during the lifetime of the patient, I do not recollect having been present at one dissection of the disease.

It will be observed also from the preceding history how exactly the *aqueous encysted tumour* of the kidney corresponds with the same tumour in the liver ;—it has the same origin from a blow ;—there is a similar rapid growth in the cyst ;—the fluid has precisely the same appearance, and chemical character ;—and finally there is the same acute suffering from distension and pressure, before the patient's death, and the same termination in inflammation, and inflammatory secretions, which were before pointed out to the notice of the Society in the *Aqueous Encysted Tumours of the Liver*.

[*Med. Chir. Trans.*, vol. xviii., p. 175.

CLINICAL REMARKS

ON A CASE OF

AQUEOUS CYST IN THE BROAD LIGAMENT OF THE UTERUS.

A YOUNG woman, Harriet Herbert, 25 years of age, in Drummond Ward, admitted May 19th, with an abdominal tumour of about seven years' duration, for which she has been tapped twice, and each time the fluid was perfectly transparent, and clear, and colourless. The first time was about four years ago, when I drew off twelve pints of watery fluid ; the second was about two years and a half ago, when three pints of fluid were drawn off by a medical man, with whom she has lived as servant, and who was kind enough to send me some of it to examine. The swelling now occupies more of the right side than of the left, and is of moderate size ; it sometimes causes difficulty of breathing, but otherwise she suffers no inconvenience, except from its weight. General health good. Bowels rather costive. Catamenia regular. Pulse quiet and regular.

May 27th.—I tapped her, and drew off about eight pints of perfectly transparent liquid, which our notes say was rendered very slightly turbid on the addition of nitric acid, or the application of heat ; in fact, however, it required to be held against the light to make it evident that it was at all altered, and the quantity of albumen was so small, as to leave the liquid still quite transparent without the least deposit ; it was only a little white, and on the former occasions there was no evidence whatever of albumen.

She was a little feverish the next day, being very nervous and hysterical, and had slight tenderness of the abdomen, or rather of the cyst, but is now almost well enough to go home again.

When this patient was admitted into the hospital, my informant remarked

that a woman had my card over her bed, but that she laboured under *ascites*, meaning that she should have been placed in the medical wards. I knew, however, from former experience, that medical assistance would be of no avail, and had ordered her in merely for the relief afforded by the operation of tapping, her case being one of *encysted dropsy*. How, then, are you to distinguish between ascites, and such a case as this, of fluid deposited in a cyst unconnected with the general cavity of the peritoneum? Very often you are assisted by the negative evidence afforded by the absence of all those symptoms which indicate disease of the heart, or liver, or peritoneum, or whatever the part may be that causes the ascites. In this young woman, for example, there has never been at any time the least derangement of the general health, and you see her now perfectly free from any illness whatever, and she only complained to a certain degree of the weight of the gallon of fluid which has been taken away. Sometimes, indeed, when the cyst is very large, and the pressure very great, the intestines, or stomach, or lungs, may be so pressed upon, as greatly to affect the health, and cause swelling of the legs, or ascites, or sickness, or constipation, or dyspnoea, in consequence of which the case may end fatally; but then you can trace the gradual effect of the tumour, instead of the symptoms which precede the deposition of fluid in ascites. Sometimes, again, you have the positive evidence of the particular part in which the swelling was first perceived; on one side or the other the patient will tell you it was first noticed by her before the whole abdomen swelled, and when small it may even sometimes happen, as with the ovary, that the cyst may be actually moved by the hand, or by the patient's change of position, so that its figure may be determined by examination. Our patient was scarcely sensible of this on the first occasion when I tapped her, though our notes say that the swelling seemed at present a little more on the right side than on the left. Except when the cyst is very large indeed, you can almost always detect the nature of the case by the sounds on percussion, the fingers reaching the alimentary canal in many places in ascites, while in encysted dropsy the part is perfectly dull, because the alimentary tube is behind it. So that when lying on her back you can, in such a case as Herbert's feel no air in front, except in the higher part, where the stomach and colon are situated, but you can detect it at the sides, behind the tumour. In ascites, on the contrary, you can feel it in front, but none at the sides, because the fluid gravitates there. Make the patient with ascites turn on one side, and you will probably feel the bowel again on the uppermost side, from the fluid sinking into the most dependent position; while, in encysted dropsy of any considerable size, the position of the cyst is not altered by change of position, and the sound remains the same, however she may lie. It must be confessed, however, that there are cases of either kind, especially when the quantity of fluid is very large, which may be

mistaken for each other, till an operation shows the nature of the fluid ; and, as you may have heard, encysted tumours may be believed to exist, and operations attempted, when there was in reality no tumour whatever in the abdomen ; besides which there will be difficulty of diagnosis in some cases, in which there is some effusion in the peritoneum in addition to that in the cyst, and caused by the irritation of it. I have several times drawn off the fluid from both situations at once.

The disease, then, was not ascites, but a form of encysted dropsy. But where was the fluid situated ? In forty-nine cases out of fifty, when the fluid is in some cyst in the abdomen, you would believe that it is an ovarian tumour, and this case bore every resemblance to one of this kind ; but when you tap an ovarian tumour, the fluid is almost always a thick kind of mucous substance, of every sort of colour and appearance, which I have known to be so full of albuminous substance, that it has become solid enough, immediately after it has been extracted, for a spoon to stand in it, as in a solid jelly, and it is at least almost always very tenacious and thick. In this case, however, you have seen that the liquid was perfectly transparent and watery, and so it was at the two previous times of operation. Even now, on the third operation, there is only a very faint trace of albumen. Most probably, therefore, the case is one of those serous or aqueous encysted tumours, which may occur in any part of the body, and you may see on the table several specimens of them in various situations ; but you may see them most frequently in the liver, where they are seen in the preparations in every degree of development. When she was in the hospital, four years ago, under Dr. Chambers's care, I removed, as I have mentioned, a gallon and a half of the same liquid, and from its appearance we then believed the cyst to be in the liver ; and from its being so long after the operation before the liquid began to accumulate again (for after the last tapping she says it was a year and a half before she perceived any return), and from its still possessing the same qualities I am inclined to believe at present, as I was then, that it occupies this situation.

I will refer you to a paper which I drew up, and which was published in the 18th volume of the *Medico-Chirurgical Transactions*, for a full account of these serous or aqueous cysts, and of their effects, more especially when situated in the liver. You will find there also the distinctions between such tumours—which are often erroneously called hydatids—and the real hydatid tumours of the liver, such as are seen in these other preparations ; the cyst which contains the hydatids being indeed like the cyst of the aqueous tumour, but the two diseases being otherwise quite different. They are generally called serous cysts from their appearance ; but the nature of the fluid secreted by them is very different from that of any natural serous membrane, all of which, except the arachnoid, secrete a liquid containing a

considerable quantity of albumen, which is easily precipitated by heat or nitric acid. These new cysts, on the contrary, contain, according to Dr. Marcet's analysis, nothing but a very small quantity of animal matter, which he calls muco-extractive, with a few grains in one thousand of saline matter. Mr. Spitta has been kind enough to analyze the fluid in this case, and finds it to correspond with this description;* and whenever you find such watery fluid in the body, you may conclude almost certainly that it comes from an artificial cyst, and not from any natural cavity, in a dilated state; and on this account I prefer the term aqueous cyst to the more common term serous tumour.

I do not wish you to understand, however, that the reverse holds good, and that when you let out *serum* (that is, transparent liquid, holding a good deal of albumen in solution), the fluid is always *necessarily* secreted by a natural cavity. On the contrary, many of the newly-formed cysts, at a subsequent period of their growth, and in some cases even when the cyst is of small size, undergo some change in their state, by which the secretion is altered, and the cyst also changed. Sometimes, for example, the cyst is lined by a thick layer of lymph, which at first sight appears to be a large hydatid, but which I rather believe to be a thick mass of adhesive lymph, or albumen, like the masses often seen in the pleura, which exactly fills up, and is in contact with, every inequality of the interior of the cyst. Here is such an appearance, which was found unexpectedly in two cysts in the liver in a patient of mine, who died of some other complaint; you may see the cysts of considerable size, with their lining; and there was a similar one in one lung of the same patient. I remember a patient being brought into the hospital, who had fallen from a waggon containing some empty baskets, one of which had fallen upon him, and had ruptured a very large cyst of this kind in the liver, containing a layer of this lymph, with several pints of liquid [see *ante*, p. 150].

At another time there will, in cases of newly-formed aqueous cysts, be evidence of inflammatory action afforded by portions of coagulable lymph floating loosely in the liquid, which will itself also show that it contains a good deal more in a state of solution; or the fluid contents will be darker coloured, and mixed with coloured blood, so that it will coagulate from this cause, without distinct evidence of the secretion of lymph by inflammation.

In a third case, inflammatory action will cause suppuration in the cysts, as

* Chlor. sod. and potass; sod. with anomalous animal matter, soluble in alcohol..	7·6
Phosph. and sulph. soda, anomalous animal matter, insoluble in alcohol	1·2
Albumen	1·2
Water	990·0
	<hr/> 1000·0

in an interesting case, from which this preparation was taken, of aqueous encysted tumour of the kidney, the history of which I published in the same volume I have before referred you to. There was great obscurity as to the nature of the tumour in this case till I punctured it, and let out eighteen ounces of nearly pure water; when, for the reason I have already given, it was clear that it was an aqueous cyst, probably from its situation, connected with the kidney. It filled again, however, and became of immense size, and the irritation it excited carried off the little patient; and, on examination, out of five pints of fluid which it contained, a quarter perhaps was formed by a secretion of white purulent liquid. The kidney, as you may perceive, was quite healthy, with a small one separate from the natural kidney.

In other cases, again, the fluid secreted by the cyst is formed of a thick tenacious mucus; this may be found in other situations, but is especially common in the ovarian cysts, where immense quantities of it are met with. It would appear probable, from the observation of Dr. Babington, that this is the result of an inflammatory change, by which pus would be secreted were the rest of the fluid acid, but the pus is converted into mucus by the alkaline nature of the watery part of the liquid. You can thus, in diseases of the urinary organs, observe tenacious mucus and pus alternate with each other, and will require no other test of the acidity or alkalescence of the urine.

Lastly, you will find an extraordinary extent of sloughing and fungous appearance when aqueous cysts are opened, as in this case and preparation of what I believe to have been an aqueous encysted tumour of the liver, for which change I must also refer to my paper. I may observe, indeed, that Dr. Malcolmson has sent me a paper of his, intended to show that the cases I had described of this singular process were abscesses of the liver; but although his paper showed me, what I had not myself observed, that abscesses of this organ may undergo a similar sloughing process, there were many circumstances which convinced me, as the preparation perhaps will show you, that those I had published were not of this description, but were instances, in all probability, of abscesses in these encysted tumours.

I said that the cysts also undergo changes, and in general the thinner the cyst itself the more simple is the nature of the fluid. The sac becomes by degrees (in some cases only, however), thicker and more dense, till it is converted into a tough fibrous substance of considerable thickness; so that some persons have called them, when in this state, fibrous tumours, in contradistinction to their earlier condition of serous cysts; and in cysts whose structure is thus fibrous I believe the secretion is always albuminous to a greater or less extent, and the colour also is generally darker than in those of thinner texture. And then, finally, when according to the usual

laws of transformation of morbid tissues, a thin and transparent serous cyst has been converted into a tough fibrous substance, the fibrous cyst may itself undergo another conversion into bone ; so that you may see some of these serous cysts of the liver, and elsewhere, more or less osseous ; hardly any part of the sac, in a few instances, escaping the ossific process.

There is yet one further alteration to which the aqueous encysted tumours, and indeed almost any cyst, are occasionally liable, especially in some situations, such as the ovary. It is the development in their interior, in the manner described by Dr. Hodgkin, of secondary cysts within the coats of the original one, or of masses of half gelatinous substance in numerous cysts, or in a solid shape, such as you may see in these preparations. These new bodies are often called malignant ; but I believe that they are often quite free from malignant properties, though closely resembling the cysts, and the changes of these cysts, which take place in really malignant diseases. This is a subject, however, which we will not at present enter into.

You will find, then, that there are cases of aqueous encysted tumours in internal situations, which are often fatal in their effects, especially as they are inaccessible, and beyond the reach of medical or surgical remedies. Our patient, Herbert, supposing her to have one of them in the liver, has derived no advantage whatever from medicine, and living in the service of a medical man, she has tried a great variety ; nor have local remedies any material power over such cysts when deeply situated, as in her case, where it is within the abdominal muscles, even if not in the liver. Relief or cure is therefore to be expected only from some operation, if they are accessible to this at all ; but I must refer to the 18th volume of the *Medico-Chirurgical Transactions* for a full account of the treatment necessary for these tumours when situated in the liver.

In Herbert you have seen that the cyst has been three times emptied by the trocar, and the former operations have not been succeeded by obliteration of the sac by pressure, which is probably not unfrequently the case, when in the liver, as in some cases which I have seen. Neither was there any suppuration or sloughing away of the cyst, which took place in the girl from whom this cyst escaped : she was tapped by Sir Benjamin Brodie, and some aqueous fluid evacuated from a cyst apparently in the liver, after which a good deal of fever and irritation ensued, succeeded by a discharge of pus from the bowels, and then this cyst came away, which looks exactly like one of these tumours, which may have passed into the colon, just as the contents of hydatid encysted tumours of the liver so often escape when the same route has been established by adhesion and ulceration. The operation you have witnessed will of course afford the patient temporary relief, but probably the sac will fill again as it has already done, though much more slowly than is usually the case in similar tumours in the ovary.

You have seen, also, that the danger of the operation is inconsiderable ; in fact, what little irritation she experienced was rather hysterical than inflammatory.

[*Medical Gazette*, vol. xxviii., p. 838, Aug. 20th, 1841.

[NOTE.—From the subsequent history of this patient, considered with what is stated in the lecture, I was induced to think that the cyst was really situated in the broad ligament of the uterus, as was the case in the ovarian tumour removed by operation, and commented on at page 136 of the first volume. If situated in the liver, as at first supposed, it could scarcely have continued so many years, and required operation so often, and at such very irregular intervals, without some more definite effects on the functions of that organ ; nor would the fluid evacuated have always remained of the same watery nature if the cyst had been in the ovarium itself, though it would naturally have been so, if situated in the adjacent membranes. That it should be situated in this part is also most consistent with the due performance of the uterine functions, which the case subsequently evidenced. These several circumstances appear to me deserving of record in the following brief summary :—

1834. The tumour was first observed when she was 17 years of age.
1. 1837. August.—Ten pints of fluid removed by tapping.
2. 1838. February.—Nine pints removed ;—six months after the last operation.
3. 1841. May 27.—Eight pints removed ;—three years and three months afterwards.
4. 1842. May.—Six pints ;—after twelve months' interval.
5. 1844. October 29.—Eight pints ;—two years and five months after the last time.
6. 1846. February 28.—Ten pints ;—one year and four months after the last operation. She was married in February 1849, and confined of a seven months' child—stillborn—on November 16th.
7. 1850. February 14.—Ten pints removed ;—after no less than four years' interval. Confined of a living child in the spring of 1851.
8. 1852. July.—A small quantity of fluid removed by tapping, while she was pregnant, and apparently two cysts felt. Confined in December of this year, of a malformed dead child.
1854. She was again confined of a living child in June 1854, and was then in good health, with no apparent return of fluid ; since which time I have not heard of her—twenty years having now passed since the tumour was first discovered.]

PECULIAR FORM OF SUBCUTANEOUS SEBACEOUS TUMOUR.

A GIRL, 15 years of age, was admitted into St. George's Hospital with a tumour in the centre of the back between the scapulæ. It had begun thirteen months before, and was supposed to have been a boil. After giving her much pain it burst, but soon began to increase again, and more rapidly after she received a blow within the last six months. Four months since a surgeon punctured it with a lancet, but little more than blood escaped.

The tumour, on her admission, was nearly four inches long, and above two inches wide, and from an inch to an inch and a half in thickness, some parts of the surface projecting more than others; it was very hard, but quite moveable, and the more prominent parts were of a dark livid colour; along the surface was a thin elongated cicatrix, nearly two inches and a half long, and three-quarters of an inch wide, resulting from the lancet puncture; and some leech-bite cicatrices were rather hard and elevated.

It was removed with very little hæmorrhage, and on a section being made, was found to contain much unorganized substance of a whitish brown colour, and of the consistence of soft chalk, with slight grittiness, small portions of which could be turned out of the cellular tissue of the tumour, but the section showed that meshes of red cellular texture everywhere pervaded its structure; around and mixed with this appearance was some firm cellular tissue and cutis, with serum and lymph, such as the integuments are converted into, in elephantiasis or other forms of long-continued chronic inflammation, and immediately below the skin was a white line, lost at each end of the tumour, and which might be supposed to be a cyst spread out after being opened or ulcerated on its under surface.

The appearance to the eye of the sebaceous origin of the chalky looking substance was confirmed by microscopical examination by which it was seen to consist almost entirely of epithelial cells of different shapes and sizes, and in various stages of condensation, as exhibited in a drawing by Dr. Bence Jones, which showed also the manner in which the separate masses were formed by an aggrégation of the cells and scales. Chemically examined by Dr. Jones, there was found to be scarcely a trace of fatty matter, and the saline matter consisted almost solely of phosphate of lime.

It appeared probable, therefore, that the tumour originated in a common sebaceous cyst, which had healed externally after having ulcerated spontaneously, and having been punctured by the lancet; but the cyst not having closed below the skin, the sebaceous epithelial cells continuing to be formed, had forced their way in all directions in the cellular membrane, in which some inflammation had been established, the cyst itself appearing to

be expanded over the surface below the skin. If an external opening had existed, a horn of the usual character, would have formed; but in the loose cellular tissue a peculiar infiltrated form of the disease had been produced, constituting an undescribed variety of sebaceous tumour, the removal of which required an unusual loss of skin and subcutaneous texture.

[*Pathol. Trans.* vol. i., p. 338, 7th February, 1848.

SERIES OF SPECIMENS OF CYSTIC TUMOURS.

THE tumours referred to in this communication were not those in which a cystic tumour was formed by congeries of single cysts in the natural structure of any part, nor those in which the unilocular cyst was rendered multilocular by the formation of partitions within it, but those only to which the name of tuberos cystic tumour was given by Mr. Hawkins, from the number of irregular projections from a single cyst or several cysts, into their contained fluid which gave them a singular appearance. They are often called hydatids by surgical writers.

1. The first specimen was a tumour removed a few days before from the breast of a female, aged 47, in whom it had commenced four years since, and had been growing rapidly during the last year; it was of the size of a melon, with dark-coloured skin stretched over it, and pretty adherent to it, elastic, but with very little feeling of fluid, and without any enlarged gland to excite a suspicion of its being anything but the cystic tumour of this kind. The section showed that it was almost entirely solid, but with some cysts, the only large one being near the nipple; and into the cysts, particularly the great one, projected masses of yellowish lymph, organized and covered by their vascular membrane, and so irregular as much to resemble bunches of currants of different sizes. The rest of the mammary gland was quite healthy. The section looked like a form of malignant structure, but was really only a good example of the latter stage of one variety of tumour, very well described, as it exists in this organ, by Sir Benjamin Brodie, under the name of *ccro-cystic* tumour, who has pointed out its origin in an obstruction and dilatation of one or more of the lacteal ducts of the gland, with the subsequent deposit of the new solid matter seen in the preparation.

This origin seemed confirmed by the microscopical examination of the new growth which Mr. Hawkins had made with Dr. B. Jones; for the fluid contained a great number of fat-globules, in which it differed from ordinary serum; and the solid part was found to have a completely fibrous texture in the partitions of the cysts, dense and strong in some parts, while in what were probably more recently formed portions, there were shorter and finer fibres running longitudinally, and a multitude of small cysts, resembling the

cells of mucus more than those of any other. The patient was doing well, and there was in such cases no reason whatever to apprehend any return of morbid growth, the nature of the tumour being not in the least allied to carcinoma.

2. The next specimen, also from the breast, was, he believed, an example of "*tuberous cystic tumour of the serous cyst.*" He had removed it from the breast of a woman 52 years of age, in whom it had commenced seven years previously, and was as large as a child's head, with similar dark colour to that of the last. The feeling of fluid being very distinct, he punctured it with a grooved needle, and let out six ounces of serum, and as solid irregularity was then evident, serving to show that it was not a simple cyst which could be cured by other means, he removed the whole tumour two days afterwards. The cyst contained about a pint and a half of reddish brown serous fluid; and although the nipple was apparent, the structure of the gland seemed entirely absorbed by the pressure, so that no trace of it was perceptible. About three inches from the nipple was a small mass of tubera, about three inches in diameter, and about an inch and half in thickness, of a firmer fibrous texture than the former, the fibres being for the most part perpendicular to the cyst, and while their pedicles were distinct the softer loose ends of the masses had coalesced in many parts by adhesion, so as to be covered by one membrane. If there were a doubt of its being a serous cyst, it must then be considered as a modification of the cystic tumour formed like the last out of the mucous ducts.

3. Another preparation showed a very good example of tubera from the serous membrane of an ovarian cyst, and was a small portion of a very large tumour which he had removed, after death, from a lady whom he had tapped several times, and in whom innumerable tubera, from the size of a pea to that of an orange, were quickly formed, so that he had difficulty at last in finding a part through the thin abdominal parietes where he could pass the trocar without perforating one of these masses. The cyst was everywhere adherent to the abdomen, and the tumour, though cystic only, bore the greatest resemblance to some examples of areolar or colloid carcinoma, and had been fatal in a comparatively short time by inflammation of the cavity and of the peritoneum.

4. The next specimen was one of similar growths into the cavity of a sebaceous cyst which he had removed from a man, about 50, who had a hard tumour the size of a walnut, of rather a dark colour, in the integuments of the abdomen, and which commenced three years before its excision. The interior showed a division of a single cyst, or the junction of two cysts, having the remains of the opening of one on the surface of the skin, the contained fluid was partly serous, partly sebaceous, and several small growths of a yellowish colour projected into the cavity, in appearance exactly like

those of the analogous cystic tumour of the breast. It was not examined microscopically.

5. Another preparation was removed from the labium of a young female by Mr. Cutler, having the feeling of a fibrous tumour of that part in consistence; but which was found to contain some thickish fluid in a cyst, the walls of which were studded with small masses of solid structure of some degree of density, and the remains of an orifice appeared at one part of the surface, which left no doubt that it had been one of the follicular cysts often found there, with the admixture of solid growths into its cavity.

6. The last of the series was a specimen of solid bursal tumour removed from the surface of the ligament of the patella, which instead of the usual appearance of a thick cyst, with a smooth lining membrane, was found to be intersected by numerous partitions and bands of lymph, with some irregular organized growths in the inside of the cavities.

Mr. Hawkins thought a series showing the general disposition of various encysted tumours to become cystic, solid, or half solid bodies, with organization of the deposits within and around the cysts, might not be undeserving of attention, since they often bore much resemblance to malignant growths both on an external inspection and on section after removal; and in doubtful cases the knowledge of the probable existence of a cyst in an earlier stage of the morbid growth might sometimes assist the diagnosis, and enable a promise to be given that there was no probability of any return of disease.

[*Pathol. Trans.* vol. i., p. 340, 7th February, 1848.]

PATHOLOGICAL APPEARANCES IN NERVES.

So little is known relative to the diseases of the nerves, that perhaps the following facts, although I am unacquainted with the history of the subjects of them, may not be undeserving of record.

1.—*Curious appearance of the Median Nerve.*

In the dissection of the arm of a female of middle age, who had been brought into the dissecting room of Great Windmill Street, the following appearances were observed. The flexor digitorum sublimis was altered in structure rather below the middle of the fore-arm, the two portions of the muscle belonging to the middle and fore fingers having a transparent, ligamentous substance, about an inch in length, uniting the muscular with the tendinous parts; this new intermediate substance having the form of tendons, but being much thinner, and not fibrous. The flexor carpi radialis was partly deficient, the upper muscular part being small, and having united with the flexor of the fingers above the ligamentous substance just

mentioned, and only about half an inch of the tendon remaining above the annular ligament, the end of which was ragged, as if torn. The median nerve, about the middle of the fore-arm, terminated in an oblong tumour, about one inch in length, and a third of an inch in diameter in its largest part, of a light brown colour, soft but firm in consistence. At the upper end of the tumour the fibres of the nerve separated from each other, and were spread out principally on the outside of the tumour, retaining their white colour, while at the lower end, the tumour adhered to the new ligamentous part of the flexor digitorum sublimis so firmly that it could not be dissected from it. The median nerve, below the annular ligament of the wrist, was of the general size, and was distributed in the usual manner, but the trunk being traced upwards, it was found not to be connected with the tumour at the end of the upper part of the nerve, but about an inch above the wrist to descend towards the outside of the arm, and to become firmly united to the ragged tendon of the flexor carpi radialis close to its insertion into the trapezium, forming a loop, the convexity of which presented upwards. There was thus a complete separation of the median nerve into two parts, with an interval of about three inches between them. No nervous filaments passed from the end of the tumour towards the highest part of the loop formed by the lower end of the nerve, nor was there any of that soft substance which often intervenes between the cut ends of a divided nerve, before time has been allowed for the formation of new nervous communications. There was, however, an enlarged branch of the superficial division of the muscular spiral nerve, which was given off about four inches above the wrist, and descended through the soft mass already described in the flexor digitorum sublimis, to join the convexity of the loop in the median nerve, and one or two smaller anastomoses were formed by filaments coming off nearer to the wrist. The communicating branches between the ulnar and median nerves in the hand were not larger nor more numerous than are usually found.

For half-an-inch above the annular ligament, the radial artery was of its usual size, but was entirely deficient for nearly three inches higher than this point, the lower part of the artery being supplied by an enlarged branch of the inter-osseous artery.

From the alteration which had taken place in the muscles, nerve, and artery, at the same part of the fore-arm, it seemed most probable that some wound had been inflicted a considerable time before this woman's death, by which all these parts had been divided in such a manner as to produce the curious adhesions which I have described; and that the tumour which had formed at the lower end of the upper portion of the nerve, was the result of an effort to prolong the extremity so as to effect a junction with the lower portion, something similar to this enlargement being often seen connecting the divided ends of a nerve, though I have never seen so much new substance

formed in such circumstances ; but no cicatrix or other evidence of a wound could be perceived, nor was there any external indication of any disease having existed, nor indeed does it appear easy to imagine that any internal disease could have produced such a separation of the nerve : and yet it is evident that it could not be a natural formation, since the muscles and artery were also unusually formed, and the enlarged branches of the spiral nerve are similar to the new filaments which are often thrown out to connect two portions of the same nerve when cut through. I am disposed, therefore, to imagine that some wound had been received, but that the cicatrix was not large enough to excite attention, and that it had been rendered less conspicuous by the time which had elapsed since the person's death, or that it had been accidentally destroyed during the dissection.

Whatever be the cause of such a division of the nerve, it would have been highly interesting to have known the circumstances attending it. From the time of Galen, many experiments have been instituted to ascertain the interval which elapses before a nerve regains its functions, and the observations of Mr. Swan have made us acquainted with the manner in which the re-establishment of the nervous influence is in most instances effected ; by the intervention, namely, of a peculiar soft substance when the two ends are nearly or actually in contact with each other, or occasionally by the formation of new connecting nervous filaments, which were, in this instance, thrown out from another nerve, the spiral, and not from the divided median nerve. With regard to the restoration of sensation in the parts supplied by the spiral nerves, the remarks made by Mr. Abernethy and by many other surgeons, who have performed similar operations to those related by him, are sufficient to establish the fact, that no long time elapses before the parts thus insulated recover their sensation ; and many instances of division of the nerve in cases of *tic-douloureux* of the face, have proved that the same circumstance takes place with the branches of the fifth nerve. Some unfortunate cases, on the other hand, of division of the deeper nerves, as of the sciatic nerve by a musket-ball, have proved that the recovery of muscular power is much more slow than that of sensation, so that some persons have remained crippled by such injuries for eight or twelve months, or for their whole lives. In this case, from the size and appearance of the muscles which were supplied by the median nerve below the division, I should judge that this woman had full command of her hand, so that the few small branches of communication with the spiral nerve must have been sufficient for the propagation of the nervous influence from the spinal marrow.

2.—*Concretion round the Phrenic Nerve.*

In another subject in the dissecting room a bony concretion, such as may often be found near the root of the lungs, and which is probably a deposition

in one of the bronchial glands, had been formed on the anterior part of the root of the right lung; this tumour was very dense, irregular on the surface, and about the size of a large filbert, and mixed with carbonaceous matter. The deposition had taken place at the part where the phrenic nerve passes towards the pericardium, and had arisen in such a manner as to occasion a splitting of the nerve into three distinct filaments, two of which were quite surrounded by the calculus, the other only adherent to its outer surface. No enlargement existed in these portions of the nerve, which passed on as usual to be distributed to the diaphragm. But on the upper surface of this muscle, under the pleura, another small absorbent gland was enlarged, but soft in its texture, and through this gland several filaments of the same nerve again passed before they were lost in the muscular fibres.

I have often seen the nervi vagi surrounded by diseased bronchial glands, where there did not seem to have been any disturbance of the viscera supplied by the nerves. But from the very hard nature of the concretion, which in this instance completely encircled the phrenic nerve, it appears not at all improbable that such a circumstance might give rise occasionally to an incurable asthma, from the disturbance which it would produce in the action of the diaphragm.

[*Medical Gazette*, vol. i., p. 271, Jan. 21, 1828.]

CLINICAL OBSERVATIONS

ON

1. *A case of Ossific Formations in Muscles.*
2. *Case of Temporary Tumours among Muscles.*
3. *Contraction of the Fingers of both Hands.*
4. *Suppurating Bursæ in the Sole of the Foot.*

THE natural and new formed tissues of the body are capable of undergoing a transformation from one state to another; and a very common order in which such a change may be observed is this:—Some common cellular membrane may be subjected to pressure or other influence, by which the tissue is first condensed and smoothed into a cyst, such as you can see in this preparation resembling a serous membrane, and secreting fluid. In the course of time, the cyst, by inflammation, may be thickened still more, and altered sufficiently to resemble a completely fibrous texture, still preserving, perhaps, its smooth secreting surface; and then, finally, as you see here, the fibrous texture may be converted in part, or wholly into bone. When there is an excess of earthy matter in the system, you have evidence of the fact sometimes in the formation of exostoses, or excrescences from the bones; but you will also see it in the change of the softer fibrous tissues into bone; sometimes in new formations, as in this serous cyst from the liver, or this

bony tumour which I removed from the skin, and which appears to have been a sebaceous encysted tumour originally ; sometimes also in tendons and ligaments. Look, for instance, at this long process, formed by what had been the tendon of the *psoas magnus*, where it is attached to the trochanter minor ; and I remember an instance in which numerous portions of the *vasti* muscles underwent this conversion, and formed a great mass of bony processes surrounding the femur. Here, again, the ligaments of the spine have been changed into bone, and have rendered the vertebrae quite immovable on each other. These tissues are often thus changed in old persons, in whom obscure pains like rheumatism or lumbago have been known to precede the change, and seem to show its inflammatory nature ;—and I may observe, that it is remarkable that elderly people should be liable to the change in question, since, as you know, their bones have a diminution rather than an excess of earthy deposit in them. Besides the tendons and ligaments, the natural fibrous membranes also undergo the same transformation, such as this large mass in the pericardium, or this bony deposit in the *dura mater*, the *falx* being its common situation, and epilepsy being sometimes the result.

It would seem that ossification of the fibrous texture of muscles may be the result of simple inflammation ; for there was an account published some years ago of such a change in many recruits in the Prussian army, in consequence of the pressure and irritation induced by first carrying the musket. The surgeon who wrote this account says that he found it in as many as 18 out of 600 ; and that a swelling of the deltoid and pectoral muscles in front of the shoulder took place, bone being deposited so as to require removal by operation ; and that the pieces of bone were from $2\frac{1}{2}$ to 7 inches in length. It is singular, however, that such a circumstance should be thus common in one country only, and not be found in our own army, or in other armies ; for I suppose the nature of the musket, and the mode of handling and carrying it, must be nearly alike in all countries.

But, in the next place, tendons and ligaments and muscles have been occasionally known to be ossified in young persons as a remarkable form of disease. You are probably familiar with one instance, as it is found in many works in your hands, such as Cooper's *Surgical Dictionary*, which occurred in a boy who fell under Mr. Abernethy's observation, in whom the least blow or other injury would cause an exostosis, or an ossification of some muscle or ligament, till he was perfectly crippled. I recommend you also to look at the College of Surgeons, at the skeleton of a Mr. Jeffs, who lived for many years with this tendency, so that at 39 years of age, when he died, a vast number of such masses had formed, and ankylosed and fixed almost every joint or moveable part of his body.

There is, as you know, a man in the hospital who has ossification, or a tendency to ossification, in many parts of the body, and whom some of you

have seen for nearly the whole of the last year ; and as he came here at the beginning of his complaint, so that we know more of the history than in the two remarkable cases I have before alluded to, and the case is altogether very singular, I will draw your attention to this subject to-day. First of all, as the notes of the case are scattered in more than one book, and are from the pen of several successive clinical clerks, and as many of you have only seen the latter part of the case, I will give you an abstract of the series of parts affected, and the changes they have undergone.

George Brown, a groom, æt. 22, was admitted June 14th, 1843, with swellings in the lumbar and dorsal regions, which commenced a week before with violent pain, which has since subsided, but still exists when he moves himself, and which began just after he got wet through. One swelling is situated about the transverse processes of two or three of the lumbar vertebræ, on the right side, about four inches long, and an inch and a half wide, pushing the long muscles outwards ; it is of very firm texture, apparently bony, and gives no pain on pressure. There is another enlargement, of rather greater breadth, in the left dorsal region, which is, however, not so hard as that in the loins ; it gives some pain on pressure. It covers the three upper ribs close to the spine, and does not move with the scapula ; and it appears to be covered by the rhomboid muscles. He says he was always high-backed, but perceived no swelling till the week before his admission. On the 19th, five days afterwards, neither prominence was so large ; and July 10th, the upper swelling had subsided, and the lower also partly, so that the transverse processes could be felt, but with hard bone added to them, such as you can now feel ; but the note of the same date, July 10th, says, another large prominence appeared the day before yesterday beneath the *left* axilla, at the anterior margin of the latissimus dorsi, and apparently situated on the serratus magnus, and on the 17th a similar tumour showed itself in the same situation on the *right* side, and near it another hard painful swelling showed itself yesterday, situated apparently below or in the pectoralis major of the right side, from its lower border to an inch below the right nipple.

On the 21st the scaleni on the left side were observed to be hardened and stiffened with slight swelling.

On the 31st the tumours on the right side were nearly gone, but the swelling over the dorsal vertebræ was again more prominent and elastic, and another swelling was found at the side of the lumbar vertebræ of the left side, exactly opposite the one present when he was admitted. By the 23rd of August all the swellings had nearly disappeared, and he left the hospital on Sept. 6th, very well in health, and, as we hoped, cured, but holding himself very stiffly, and unable to bend the spine in bowing, which movement was performed only at the acetabulum.

But he was obliged to be readmitted on the 25th of October, in consequence

of a recurrence of his complaint, the swellings being now more numerous and more prominent than before; and the notes at this date say—On readmission it appeared that he had continued his medicines most of the time he was an out-patient; but the pain and swellings had soon returned without fresh cold. The lower part of the sterno-mastoid muscle was very hard and inflexible for about three or four inches: the original swelling of the left side of the loins was apparently ossified: there was a good deal of swelling between the left scapula and the spinous processes of the vertebrae, a little lower than most of the tumour which he had on the left shoulder on his first admission, and in the centre was a small mass of osseous substance extending laterally as if in the rhomboid muscle, and moveable: under the angle of the right scapula, raising it outwards and a good deal impeding its movements, was a swelling of the same part, apparently (in part at least) of the serratus, which had existed when he was in before, and on one rib below this swelling, and fixed to the rib, was a small exostosis: the scapula was still hard: all these swellings were painful and somewhat tender: he did not seem out of health, and was fat.

We pass on for about a month to Nov. 30th, at which time it is said, the soft swellings of the sterno-mastoid, scapula, and serratus, and rhomboid muscles, have all lessened; but his movements are much cramped, the spine being very stiff, and the right arm cannot be lifted or moved. The left arm moves easily, but the bony mass behind is now full two inches long, and is raised outwards by the scapula when the arm is depressed; it cracks by touching the base of the scapula. As this ossified mass was fast increasing, and was becoming fixed to the spine, I removed it by operation November 23rd. It was situated between the trapezius and rhomboid muscles, and was intimately associated with both, having the fibres inserted, as you perceive in the preparation, just as they might be into the periosteum of a natural bone. One end was smooth, from playing on the edge of the scapula; the other was fixed to, and partly ossified with the spinous process of the sixth or seventh dorsal vertebra. It was, as you see, about three inches long, of an hour-glass shape; the broadest part being about an inch in breadth. Most of it was firm bone, a little portion was cartilaginous, and the narrowest part was partly moveable;—it was in shape not unlike the two phalanges of the thumb joined together. Several vessels of large size were divided, and hæmorrhage took place afterwards to a great extent, so that he was very much reduced by it. The wound was slow in healing, but during the time nothing fresh took place; and on December 18th it is noted that the deposits were much diminished, except at the angles of the ribs, in the left scapula and on either side of the lumbar vertebrae.

I carry you on, next, to February 2nd of the present year, when our notes say, he perceived a swelling coming on last evening under the right pectoral

muscle, where it is attached to the ribs ; it is of an oval shape, measuring in length about three inches, in breadth two and a half ; it is soft, but immoveable. You saw in this, and in others of recent formation, the mode in which the swelling made progress, without ossifying : coming quickly, and at first soft ; the next day it was harder and larger ; and on the 4th it was from four to five inches long, by three broad ; and the pectoralis minor was now implicated. On the 12th it was softer and flatter below, but was spreading above. On the 18th it was still extending upwards to the insertion of the pectoral muscles. On the 19th the swelling was less prominent, but there was great hardness, and the muscle was knotty and irregular. By the 24th the skin and cellular tissue were again moveable over the muscle, the hardness and knottiness of which were still noted ; and on March 1st, the notes say, there was no trace of the swelling.

On the 4th of March, however, we find there is now a large swelling about the size of a goose's egg, just below the inferior angle of the *left* scapula, fixed, but apparently connected with the serratus ; soft but firm, that is, not bony ; it erepitates on pressure : this was around a small exostosis which had formed since the same part swelled in July last. There was also observed on this day a swelling about the ligamentum nuchæ, four or five inches long, and very firm, and hard, and affecting all the muscles inserted in the occiput, besides the trapezius, being nearly two inches thick, and of some breadth.

On March 7th, the swelling below the scapula had increased, it being double the size it was on the 4th, and now as large as a saucer ; the crepitation is gone, and it is much harder, and appears fixed : two days after this a cast was taken, which shows how very large the swelling then was, nor has it gone away at the present time (May 21st), though it began to lessen on the 13th March.

We pass on next to 29th March, when a fresh swelling took place in the left pectoral muscle at its axillary border ; but this lessened by April 2nd. On April 12th another formed of considerable magnitude under the latissimus dorsi of the *right* side, a little more backward than the former, which seemed to be in the serratus, and which was softer on the 15th. On this day the pectoral muscle of the left side being smaller, was found to have a hard substance in it, which I thought would prove to be osseous, but it seems to be softening a little now. Since this time no fresh tumour has been noticed.

Such is a connected history of this singular case, and you can see the state the patient is now left in : very stiff from ossification of the lumbar vertebræ, and hardness of the muscles of the neck, and unable to use the shoulders freely on either side, but particularly on the left, owing to swelling under the angle of the scapula in the serratus, and from the almost ossified state of the tendon of the pectoralis major, which is moveable in two portions where the tendon revolves at its insertion, so that the lower fibres may reach the top

of the tendon ; he has also a small exostosis on a rib on each side, which does not appear to occasion any trouble, and is not increasing.

The next question is, of what nature is this disease ? It is evidently of constitutional origin, since it has lasted so long, and has shown itself in so many different parts of the body. It came on, as you have heard, from the patient's getting wet, and apparently, therefore, is allied to rheumatism, though thousands of cases of rheumatism take place without such consequences as are here seen. The patient, however, has none of the usual symptoms of rheumatic disease, nor has he ever had any on former occasions ; there is no deposit of lithates in the urine, no acid secretion from the skin. On one occasion the water was even alkaline ; but this was at a time when he was reduced by illness, and had taken alkaline purgatives. It directly afterwards became healthy, and has been so whenever it has been examined—acid, but not in excess, and without sediment of any kind. I may observe, too, that the ossific deposit is not composed of carbonate of lime, as many earthy concretions are, but of phosphate and carbonate, as in true bone, with cancelli, and an outer shell, and periosteum, and cartilage, and with all the signs of true bone, even when examined under the microscope. There is nothing apparently wrong in any function ; the bowels act healthily, the appetite is good, and the pulse and tongue show no sign of disease ; the only circumstance which you can observe unusual, is a morbid greasiness of the skin ; but the perspiration goes on naturally, and a copious secretion from the sebaceous follicles can have no influence on the system, and is not at all uncommon.

Nor has anything been satisfactorily made out in former cases in which a tendency to ossific deposit has been observed. It has been known, indeed, to occur in more than one of the same family. I was consulted, for instance, very lately, for a young lady, who had an immense malignant tumour of the thigh-bone, and her sister also has an exostosis of apparently an innocent nature. Mr. Stanley met with a man in St. Bartholomew's, with exostosis, several of whose relations had also bony tumours, and Boyer and others have occasionally seen the same thing.

A man had his thigh amputated in this hospital, for what seems to me, judging from the preparation, to have been an innocent osteo-sarcomatous tumour, and five months afterwards the man had pulmonary symptoms, of which he died ; and you may see in the museum of the College of Surgeons that besides numerous ossific deposits in the pleura, or rather, I suppose, in the cellular tissue behind it, the lungs also have great masses of bone in them, occupying a third at least of their bulk. Some bone has also been found in an absorbent gland after the operation for a tumour of a bone ; but these circumstances are obviously incidental coincidences, evidence of excess of phosphate of lime from want of assimilation, and not evidence of return of

disease of a malignant nature, like medullary tubercles in the lungs after the removal of a cancerous tumour. Our patient is rather pale and pasty in complexion, but shows no sign of any definite derangement of system.

Neither do the local changes enlighten us as to the nature of the malady : it is obviously inflammatory, indeed, from the pain and swelling and tenderness, and secretion of serum and lymph, but I cannot say why the muscles inflame, nor why the common results of inflammation are modified so that bone is formed in the cellular tissue of the muscles, and of the surface of the ribs.

If, then, I cannot assign any cause for this curious succession of inflammations, I am very little likely to be able to tell you what you are to do for a similar case if one happened to present itself to you. Let me mention, however, to you in abstract what has been done in this case, and what has been the influence of remedies, as far as we have observed them.

First, then, with regard to local remedies, I have repeatedly used a blister over the affected part, because this counter-irritant has invariably done good, reducing the swelling and lessening the pain. I have also used a solution of iodine and iodide of potassium with a little advantage, but never with so much as seemed to be derived from blisters. Cold also relieves the inflammatory pain to some degree.

When he was first admitted, as the disease came on after cold, and thus seemed to resemble a rheumatic seizure, though with singular swellings, I gave the patient colchicum, which he took from June 19th to the 30th, with some effect, as it seemed, on the size of the swellings, and with relief of pain, but no effect, perhaps, in preventing fresh tumours. I resumed the colchicum, however, when the swellings began again on July 10th ; but as they continued to form, I changed this medicine for the iodide of potassium on the 21st, beginning with five grains, and increasing it to seven grains, three in the day ; and under its use, with an alteration of diet for the better, the disease seemed to yield pretty steadily. On August 14th I added sarsaparilla to the iodide, and he went out, as we have seen, Sept. 6th, apparently cured. But although he went on with these medicines some time longer, as he says, the disease returned in spite of them. On his readmission, therefore, on Oct. 25th, I tried him with a new plan, and put him on the use of mercury ; he took two grains of calomel, with a quarter of a grain of opium, twice a day, which he continued from that date to Nov. 17th, about three weeks, his mouth being made moderately sore by it. Under this course all the swellings were nearly absorbed, at first rather rapidly, and afterwards more slowly ; but nevertheless the mass of new bone in the shoulder went on increasing in size, and as he would plainly have been quite crippled if it had joined the scapula, with which it was in contact, as it had fixed itself to the spine, I thought myself obliged to remove the tumour. We have seen that serious hæmorrhage

resulted from the operation, from the effects of which he was a long time in recovering ; he, indeed, required much support to restore him to nearly the same strength as before. Whether it was owing to the loss of blood or not, I cannot say, but no relapse took place till Feb. 2nd, when the local remedy of two blisters was followed by an attack of erysipelas, which lasted a considerable time, beginning on the 22nd of February. This was succeeded by the formation of an abscess in the axilla of some size, originating in a gland, and during the whole of this time numerous tumours were continuing to form in the muscles ; so that the lowering of the system by these attacks, did not prevent them, as it seemed not improbable that the loss of blood might previously have done. On the 6th of April, he was again sufficiently recovered to bear some specific plan of treatment, and I gave him phosphoric acid, which he had taken once before for a few days, before I was obliged to operate. He began with half a drachm, and now takes a drachm of the diluted phosphoric acid three times daily, and has continued it till the present time (May 21st). My reason for this is theoretical only, namely, that the phosphate of lime, which he seems to have in excess, is an insoluble salt, while the super-phosphate is soluble ; and it might therefore be supposed that if the acid could act in this way on the salt, the deposits might be prevented. This is, no doubt, a very vague kind of theory, but yet it is certain that during the use of the acid, with the exception of one tumour on the 12th April, a few days after he began it, he has had no fresh inflammation, and all that were forming when he commenced its use, have much diminished.

I may be asked, as the disease is obviously inflammatory in some measure, why depletion has not been employed ? It has appeared to me, however, that the pulse never indicated this practice, and I do not think his being fatter or thinner, stronger or weaker, on low diet or good diet, has in any way prevented or accelerated the progress of the disease. It is altogether so very singular a case that although you may never see another of the same kind, and it does not, therefore, form so practical a subject as some others, I have nevertheless thought that placing the whole of it at one view before you would not be uninteresting.

[A case presenting many points of resemblance to the preceding, and reminding me very much of it, was under the care of Dr. Sibson and myself, in which temporary swellings of a singular character were formed in, or in connection with, various muscles, but without any osseous formations ; which may be annexed to it from the rare occurrence of such peculiar swellings, whether of a rheumatic character or not, as the patients themselves imagined.

This patient, a young lady, 25 years of age on March 18th, 1867, was seen by us with the right scapula nearly fixed, with an apparent tumour below it, and tilting it up and filling up the space below the rhomboid muscles towards

the spinous processes of the vertebræ, with some swelling also on the outside of the scapula above and below the spine of that bone, the swelling being firm and tender. The ribs were hardly able to move, and consequently the respiration was dull. It had begun about six weeks previously, but was much worse for the last fortnight, and was supposed to be rheumatic. On the 8th of April most of this swelling had disappeared, so that the scapula, although not moving much, seemed again to lie in contact with the ribs; but there was now a hard swelling, the size of an orange, in front of the chest and fixed to it, not filling the first intercostal space, but below this so as to throw the breast forwards, and not going into the axilla. The ribs seemed quite immoveable, and no respiration could be heard. On the 20th, there was a little breathing in this lung, and the swelling was less on the front of the chest, but had returned to a moderate extent about the scapula. On May 4th, the swelling in front had nearly disappeared, and there was also less about the upper part of the shoulder, but there was more fulness below the rhomboid muscles, and on the side of the spinous process was a round prominence about the size of a walnut, tender, smooth, and soft. There was a good deal of pain at the lower part of the spine without swelling. The ribs now moved much more, and the lung on percussion again seemed to be sound. Her health also had improved under tonics, but opium was still required, as it had been from the first on account of the severity of the pain. These swellings somewhat varied on the *right* side; but on October 14th, we found her head drawn to one side by swelling and contraction of the *left* sterno-mastoid muscle, and she walked with a stick, in consequence of pain about the *left* ilium, and there was a large swelling behind the *left* axilla, in front of and below the scapula impeding the movements of that bone and of the humerus, there being still a swelling in the original situation about the right scapula. In July, 1868, her health had much improved from residence in a different locality, but there were still several enlargements varying in size and situation from time to time. In April, 1870, she was quite free from pain and swellings, and had only a certain amount of stiffness in some muscles.]

I will take you, in the next place, to another subject—a disease which does not affect muscles like the former, but is yet allied to it, inasmuch as tendons and fascia are implicated in the affection; the case is also not very common, though you may perhaps meet with it, and ought to know how to treat it. The case is this:—

William Kisby, æt. 39, a coachman, was admitted on the 17th of April, with contraction in a greater or less degree of all the fingers of both hands, but chiefly of the fore, ring, and little fingers of the left hand, and of the ring and little fingers of the right hand. The fascia in the palm of the hands is very tense and hard, as also are the parts of the fascia leading down

to the metacarpal bones, and also those portions of the fascia which pass to the sides of the phalanges. There is no ankylosis of any of the joints, but there is partial dislocation of the second phalangeal joint of the ring finger of the right hand, which arises from the pressure of the fingers in their bent position against anything the man tries to grasp. The cutis in the contracted parts is much condensed and furrowed, and apparently thickened. Now the notes correctly describe the nature of the disease in this case; namely, that the contraction is in the palmar fascia, and not in the flexor tendons, though on first examining the hand you might easily suppose that the lines of hard substance, which start up when you try to extend the fingers, are the flexor tendons. In the *Clinical Lectures* which have been published as given by Dupuytren, you will find a very good account of this affection; he says he was the first person who discovered the real nature of this contraction, and mentions one case which he cured by operation after it had been pronounced incurable by Sir Astley Cooper. Dupuytren makes the same claim, indeed, with regard to most of the subjects he treats; but in this instance, at all events, he is probably correct in asserting that he first ascertained the cause of the contraction by dissection. It consists, then, of a slow contraction (with some inflammation probably, as there is sometimes pain in the affected part) of the portions of the fascia which separate from the annular ligament in the palm of the hand, and of the subdivisions of the fibrous mass which pass to the phalanges of the fingers, the tendons being only somewhat shortened by want of use for several years, and the skin being a little hardened and condensed, and intimately united with the fascia. Dupuytren says that it takes place in those persons who are subjected to laborious employments, in which some hard substance is constantly rubbed and pressed in the palms of their hands, and he instances coachmen, of whom our patient is one, as being one of the classes liable to it. I think, however, you will be able to find a *few* coachmen in London besides this man, and perhaps you will look in vain for another instance of this contraction among them. I have seen it, moreover, in several instances, in persons of a higher class of life, who have never, as far as I know, been subjected to the causes I have mentioned; so that I am not certain that the opinion of Dupuytren is correct; and I do not see very clearly why, if it were correct, the contraction should be confined, as it almost invariably is, to the ring and little fingers; nor why it should attack both hands as in this case (which is not, indeed, a common circumstance); for the two hands are very differently employed in his labours. This man had some little contraction of the forefinger also, but it has nearly gone since he has been in the hospital, and it is unusual.

The remedy for this contraction is the division of the portions of fascia which are affected; and it would appear to be an effectual cure; at any rate

it is so for a considerable time after the operation, and can easily be repeated if the contraction returns. I performed the operation, some years ago, on a patient in the hospital, and after two or three years I think the fingers were beginning to contract again slightly ; the relapse was not, however, sufficient to require a second division, as it was no inconvenience to him, so that he has not come again to me. I have not been able to perform the operation for our patient yet, for he was unfortunately attacked, a few days after admission, with gouty inflammation, to which he is liable, in several joints successively, which has not yielded readily to medicine. He is now, however, tolerably well again, and I shall probably operate on the affected parts of one hand in a day or two, leaving the other till a future time, that I may not make him altogether helpless while he wears a splint, which must be kept on for a considerable time.

With regard to the mode of performing the operation, you are aware that for contractions of tendons, we generally endeavour, at the present time, to perform a subcutaneous incision, so that no air may enter the divided parts to interfere with union by the first intention ; and the parts having united to a certain degree, extension is then made, to separate the ends while the united substance is still soft. Now I have turned over in my mind the propriety of acting thus in the present case, but I am inclined to think I shall not do so. You know that the great risk of wounds and injuries about the plantar and palmar fascia is from confinement of matter, which is then made to pass along the tendons of the muscles, and thus they form very troublesome cases. Now in order to remove the contraction in this case, it will be necessary to make several cuts ; the band of fascia must be divided in the palm before its separation to the two fingers ; each finger must probably have another incision opposite to the joint with the metacarpal bone, and very likely smaller cuts must be made at the sides of each finger. To do this below the skin, which is inseparably joined to the fascia, must be at least very difficult, and not without risk of the digital arteries and nerves being injured ; and then, as the extension on a hand splint must be considerable, I think it would be altogether impossible to escape suppuration in some of the several incisions. If the operation is done in this manner, and matter does form, it is necessarily confined, and may do much harm. I think, then, I shall operate, as I have done before, by direct incisions through the skin and subjacent contracted portions of fascia. It is true there will thus be several suppurating wounds, a little lint being put between the edges of the incisions to prevent their union ; but then, on the other hand, there will be no confinement of matter, and consequently no probability that the suppuration will extend itself beyond the small cuts themselves, which extension is much more dangerous than the open wounds can be. It does not appear that Dupuytren met with any mischief when he did the operation

in this way ; and when I have done it myself, there was no inflammation of any importance produced.

In the short time which remains, I will draw your attention to a case, of not much importance in itself you may think, but it is one which you will probably often witness, and which is somewhat peculiar in its nature, and would give you trouble if you are not aware of its precise nature.

Thomas Nicklin, æt. 43, was admitted last week, May 15th, with a sinus at the under part of the right heel, leading deeply down towards the under part of the os calcis ; a probe passed along it does not strike on exposed bone. The skin and parts around the sinus are very much thickened ; the surface of the cavity is pale and without granulations. It came from cold, sixteen or eighteen months ago, as a small hole in the skin, with discharge of matter. There are some other notes relating to his health, which I will not read to you, as they are irrelevant to the remarks I am going to make.

Now I believe that this has been, in reality, a case of suppuration in a bursa under a large corn ; and, without being aware of it, you will easily fail to recognize such a case ; and yet you see, by this man's abscess, which burst a year and a half ago, that there must be some reason for so small a cavity not healing in this time ; and this reason is, the peculiar nature of the bursa, which is incapable of forming granulations ; and here, as the orifice is larger than usual, you can see the inner surface, which is pale, and thin, and white. Such a bursa not unfrequently forms under a corn, to defend the ligaments and joints from its pressure, either in this situation, or under the ball of the great toe, or under the metacarpal joint of the little toe ; and is liable to suppurate, and discharge by a small orifice, with a hard margin : on inserting a probe, you occasionally find that the ulceration has extended in the contrary direction also, and has destroyed the periosteum of the bone, or has even opened a joint, so that bone is felt by the probe, which exfoliates, or the joint is ultimately quite ankylosed. A similar appearance is thus produced to what you can see in another patient admitted on the same day, with ankylosis of a part of the joint of the metacarpal bone of the great toe with the first phalanx, while dead bone is felt in both of the exposed surfaces.

What I have found it necessary to do, in such a case as this, is to enlarge the orifice, and if it is necessary, destroy the whole of the inner surface with strong nitric acid, inserted by means of a little sharpened piece of wood ; then you will succeed in procuring a granulating surface, and you can afterwards apply common remedies—red precipitate, solution of caustic or copper, and so on. You should at the same time cut away as much as the thickened cuticle or corn as you can from around the opening. The nitric acid gives little pain to the bursal surface, and is quite effectual in general. If the

cavity or sinus is close to bone, or to a joint, you must apply the caustic somewhat carefully, in order not to affect those parts; or if the bone is already denuded, the acid may be applied to its surface also, and, partly by its stimulant quality, and partly by its chemical action on the bone, this part will probably be absorbed, or become healthy and heal up. Two or three applications of the acid are, from this cause, sometimes necessary, in order to avoid the mischief endangered by the too free application of it in the first instance.

[*Medical Gazette*, vol. xxxiv., p. 273, May 31, 1844.]

OPERATION FOR CONTRACTION OF THE FINGERS.

Thomas Coffee, æt. 30, was admitted into St. George's Hospital, January 14th, under the care of Mr. Hawkins, in consequence of a deformity of the left hand, which seriously interfered with its use. The little finger was kept permanently contracted in the bent position, so that the back of the first phalanx was always presented to any object which he wished to grasp, the joint being directed towards the root of the thumb. There was a broad thick piece of skin and subjacent substance running from the centre of the palm of the hand half way down the first phalanx, and partially towards the second, the base of which in the palm seemed, when the finger was stretched, to have a narrow band, looking just like a flexor tendon in shape and size, running up towards the wrist, the extension of which caused a good deal of pain. The ring-finger was also partially contracted in the same way, but nothing like a tendon from this finger could be perceived connected with the palm.

This contraction had gradually taken place during the last five years; during which time nothing of any consequence had been done for him, and the inconvenience being now considerable, he wished it, if possible, to be relieved.

Mr. Hawkins ascertained, by moving the fingers in different ways, that there was no adhesion of the tendons, and that the contraction was in the fascia only, and determined to divide the contracted parts. Before operating, however, he gave the patient two doses of calomel and haust. sennæ, to prevent the inflammation which would otherwise probably ensue; and on the 22nd he performed the operation, which he explained afterwards to this effect:—

The little operation which you have just seen, is one which, perhaps, you have not before witnessed, as it is very seldom done; partly because the disease seldom produces so much inconvenience as to induce the patient to submit to it, and partly because its nature is not well understood; for it is

generally supposed to be a contraction of the tendon of the flexor muscle, and that its division would be very troublesome, from inflammation of its sheath, or that it would render the finger useless afterwards. It is an affection which I have, however, repeatedly seen, and it is remarkable that it almost always selects the little and ring fingers, and consists in a slow inflammatory action in the fascia of the palm of the hand, going on for many years (in this instance for five years) before it produces very great contraction, and arising (as in this patient) without any known cause. The only description of it with which I am acquainted, is one by Dupuytren, who seems to have frequently operated for it on the principle which I have adopted here. The portion of fascia affected was that which comes from the annular ligament and divides near the base of the fingers, so as to embrace the sides of the little finger and one side of the ring finger; and what I did for it was this. I first made an incision, about three-quarters of an inch long, in the centre of the palm, across the base of that portion of fascia which went to the fingers, and which started up when it was stretched, so as to look like a tendon. This being divided, a good deal of room was at once gained, and you saw the fat and the nerves of the fingers at the bottom of the incision. I next made a semicircular incision more than half way down the little finger, at the fold which joins it to the palm of the hand, down to the tendinous sheath in the centre, and just avoiding the artery and nerve on each side. I next divided, in the same way, the side of the ring finger next to the little finger; so that by these incisions the portions of the fascia inserted into the fingers were divided, and the fingers could be extended almost to their natural length, allowing only for the shortening of the flexor muscle and tendon in five years, and which will, no doubt, soon yield. I also made an incision, in a longitudinal direction, through the thick substance formed by the skin and fascia together, which was there more than half an inch thick, thinking that this might, perhaps, allow more easily of extension. I gained nothing, however, by it, unless it facilitates, by suppuration, the removal of this hard substance which has been formed by the continuance of the disease. I have placed (as you saw) a little lint in each cut, and have directed it to be placed on a splint, to keep the hand at rest, as there will, perhaps, be some inflammation from opening the fascia, and to keep the fingers stretched; which it will be necessary to do, even after the wounds have healed, for some time each day, or at night.

Jan. 27th.—The wound being dressed, was found to be suppurating well; and there was no inflammation or swelling, such as might reasonably have been anticipated.

Feb. 20th.—The incisions have quite healed and the fingers are perfectly straight; so that there is every reason to suppose that he will regain the perfect use of his hand, all the fingers of which are a little stiff at present,

from the use of the splint. The last few days, however, the splint has been left off, and the flexion of the fingers is improved. Almost the whole of the thick mass formed by the contraction has disappeared, and he has as much power over the fingers which were operated upon as any other.

[*Medical Gazette*, vol. xv., p. 814, March 7th, 1835.]

CLINICAL OBSERVATIONS.

May 18th, 1847.

1. Division of ham-string tendons for disease of knee-joint.—2. The same with excision of large cicatrix.—3. Extension of limb in cases of diseases of hip-joint.—4. Dislocation of hip into thyroid foramen, complicated by old disease.

GENTLEMEN,—I will to-day make a few remarks, for which some cases now in the house will serve as a text; and I will first direct your attention to a case, which is instructive in many particulars, as showing what we may sometimes do to obviate the necessity for amputation in cases where disease of a joint has rendered a limb useless, but where there are no active symptoms present.

Emma Elton, age 21, was admitted on November 18th, 1846, into Princess Ward, with the following history:—"About five years ago the right knee-joint became much enlarged, but without pain. It was treated with leeches and blisters, and the enlargement was greatly reduced. At the end of a year, having had no pain in the interval, the enlargement returned, and was attended by pain, but by resting it, these symptoms subsided. She had several attacks of this sort. About two years since the pain and enlargement again returned, being much more severe than before, and she was under treatment for six months without much relief. The contraction of the limb (for which she was admitted) appears to have commenced at this time, and the leg is now bent to an acute angle with the thigh, and there is partial dislocation of the tibia and fibula backwards, and some rotation of the foot and leg outwards, but this is the case only to a small degree. There is very little motion of the joint, but it does not seem to be in an ankylosed condition."

Here, as you see, the disease had been going on for upwards of five years, returning frequently, and unattended with any great amount of pain, and was probably a mixed case of scrofulous disease of the bone, with inflammation of the synovial membrane. The tibia and fibula have been drawn backwards behind the condyles of the femur, and kept in a bent position; so that the patella is quite buried between them in consequence of the great hollow formed anteriorly when the knee is much bent. Nor could the leg be moved from this position, the attempt to do so causing such great suffering. The

limb had become entirely useless to the patient, but she was naturally anxious to save it if possible, and I decided upon endeavouring to render the limb serviceable, and made an attempt which has hitherto been attended with success.

When a knee has been kept for any length of time in a bent position, if any degree of motion remains, showing that no bony ankylosis exists, and the symptoms are in abeyance, it is right to endeavour to restore the limb to its proper position; and there are few cases in which well-directed efforts will not be attended by success. Gradual extension by means of such an apparatus, as you have seen used for Elton, must be employed; consisting of an angular splint, with a hinge at the angle, the lower part being well fitted and carefully fastened to the leg, and the upper part to the thigh. A strap also must be made to cross the knee, and to prevent the instrument from receding from the hollow of the ham. The whole is to be well padded so that no injurious effects may arise from pressure. A screw connects the upper with the lower part, by turning which extension may be made in the most gradual manner; and thus the limb can be brought by degrees to the straight position, and the patient be enabled to walk,—but, of course, generally with a stiff joint. When, however, the altered position has existed for a very considerable time, as it has in this case, the flexor muscles, by contracting, render the joint incapable of being extended, and it becomes necessary to divide their tendons. Before doing this, you must be careful to ascertain that there is no actual disease going on at the time in the joint, as if there be, the attempt to extend the limb will bring on severe symptoms. Ascertain also that there is no true osseous ankylosis, for if there be, any attempts to straighten the limb must fail. But, in serofulous disease, and in cases of stiff-joint from chronic synovial inflammation, the ankylosis is commonly caused by the throwing out of lymph, with little disposition to osseous deposit, which admits of elongation by force gradually applied. In the case before us, it was quite evident that some slight motion still remained between the tibia and femur, pain being occasioned by the attempt to straighten the joint. It was not quite so clear whether the patella was ankylosed; by fixing it between my thumbs, placed at its upper and lower margins, I thought I could detect some degree of motion perpendicularly, but of course, from its position between the condyles, it would admit of no lateral motion.

On the 26th I divided the three flexor tendons—the biceps on the outside, and the semi-membranosus and semi-tendinosus on the inside; and the division of tendons by sub-cutaneous incision, instead of cutting down upon them, is a considerable improvement in modern surgery. It is an operation of no difficulty. The patient is turned upon the face, the limb extended as much as possible, so as to make the tendons tense, and the tendons are then divided with a small narrow knife made for the purpose. Only two punctures

will, in general, be necessary in this situation, as the semi-membranosus and semi-tendinosus are usually found together. It was not necessary in Elton's case to divide any bands of fascia,—a proceeding which is sometimes required,—but there was a tight cord, stretching down the middle of the ham, which one of the gentlemen around thought had better be divided, but which was, in fact, the popliteal nerve, and which differed from any tendon, inasmuch as it extended a longer distance downwards than either flexor tendon could do, and it occupied a situation more prominently in the centre of the ham than a band of fascia would have occupied. The nerve receded in less than a fortnight after the operation, so as not to be felt. The instrument was applied about four days after the operation, when union was perfect; and by it extension was made, slowly and gradually, to a great extent, as our notes show, from time to time, till February 27th, when it is said:—"Limb much straighter. Now, however, the gastrocnemius being stretched, she cannot flatten the foot,"—a circumstance which you would expect; for the bent position of the limb would have caused the gastrocnemius to become contracted, as well as the other muscles: and being unable to yield, where the limb was extended, it would of course have the effect of raising the heel.

On May 7th, I divided the tendo Achillis by the sub-cutaneous section, and the foot is now bent to nearly its proper angle, and the limb has almost recovered its natural position.

At one time, February 24th, I was afraid, from the occurrence of pain on each side of the patella, and from there being some fulness about the joint, that the disease was about to return, but, upon leaving off the splints for a few days, it in a great measure subsided. The tibia and fibula are still situated a little more backwards than natural, and it remains to be seen whether the limb will bear the weight of the body without any ill effects. Altogether the case affords you an example of what may be attempted,—I hope with ultimate success,—instead of causing the patient to run the risk of an amputation, or to suffer the inconvenience of the joint remaining in a position which would not admit of even the assistance of a wooden leg. No inflammation occurred from the division of the tendons; it, in fact, very seldom does; and in order to lessen the chance of reproducing the disease, the limb must be kept perfectly at rest, and the extension be very gradually and carefully proceeded with.

But other causes may render a somewhat similar proceeding necessary, besides disease of the joint itself, and may succeed under much more formidable operations. I remember a patient, under my care, in whom there had been venereal ulceration of the back of the thigh and leg, which had been followed by contraction of the cicatrix, with deposit of a hard firm substance in the texture of the skin, rendering the limb totally

immoveable, and placing the leg in such a position that the heel was in contact with the buttock. I dissected the cicatrix completely from its connections, and removed it, exposing the fascia, and, in some parts, the three flexor tendons, which, standing prominently out, I was obliged to divide them, with some bands of fascia also. The portion of cicatrix I removed was some thirteen inches long, and four and a half in thickness in the centre, and the wound was the whole width of the ham. Of course, in such a case, I could not make extension immediately after the operation, but when the sloughy state, which usually follows the removal of cicatrices, had subsided, I applied an instrument similar to the one you have seen used in Elton, and by it brought the limb into a perfectly straight position, and the patient was enabled to walk firmly with it when he left the hospital. The case shows you the great advantage that may be derived from division of the ham-string tendons, though, of course, there was much risk from fever and sloughing, and the chance of secondary abscesses; but the wound having healed, and the joints being unaffected, there was no chance of relapse, which there must be when the operation is performed after serious disease of the knee-joint.

But it is not in cases of disease of the knee-joint alone that you are capable of interfering with benefit; much may be done in affections of other joints, after the acute symptoms have subsided. You may often apply the same principle to remove the deformity produced by hip-disease; when the hip is affected, you may have real or apparent shortening of the lower limb from *three* causes.

One cause is the habit the patient has of walking on the toes only of the affected side, the joint not being destroyed. The pelvis of the same side is consequently raised; a curvature of the spine takes place to compensate for this, and an appearance of shortening is given to the limb. The shortening is only apparent, however, for by measuring, in these cases, from the spinous process of the ilium to the patella, the distance will be found the same on both sides.

In another form, shortening actually does take place. The ulcerative process destroys part of the acetabulum perhaps; more frequently it is the femur that suffers; and the head of the bone, being no longer kept in its place, is dislocated; and as this takes place from muscular action, it generally lies upon the dorsum ilii. A new joint may be formed in this situation in dislocation from accident, but not when it takes place from disease, in which case, a kind of false ankylosis is formed by the pouring out of lymph, which becomes organized, and is sufficiently strong to bear the weight of the patient's body, and to enable him to walk with a high-heeled shoe. In the third case of shortening, the head of the bone is also dislocated, but it takes place without any loss of substance. In these cases, the disease is generally acute in its character, attended by the throwing out of lymph

within the cavity of the joint, and by weakening of the capsular ligament; so that the head of the femur is widely separated from the acetabulum, and a very slight accident is sufficient to dislocate the bone. The deformity may escape notice, perhaps, while the patient is lying in bed, and is often discovered for the first time upon his attempting to walk.

In those cases in which the shortening is apparent only, and arises really from distortion of the pelvis and spine, you may do much good by the employment of suitable apparatus. You remember, doubtless, a boy who was last year in Egremont Ward, and in whom apparent shortening had taken place from this cause, in whom I was able to elongate the limb, that is to say, to draw down the pelvis, so that the foot descended three or four inches before he left the hospital, walking pretty well in a few weeks' time, with the figure restored, unless the disease reappears in the joint. I kept him lying in bed (a proceeding generally rendered necessary by the disease itself), and passing a belt under the perineum round the sound side of the pelvis, I fastened it to the head of the bed. To a belt placed round the knee a cord was fixed, and to it a weight, in his case, of half a pound, but you may increase the weight according to the effect it produces. Of course as long as the attention of the patient is directed to the weight, his muscles contract, and resist the extension; but when he is asleep, or has ceased to notice it, the gradual traction causes them to yield, and the weight exerts its force in bringing down the pelvis. Of course, if a high-heeled shoe is employed in such a case, the deformity is likely to be rendered permanent, though it is necessary when there is real shortening of the limb. I have several times seen a child who has had hip-disease, attended by this species of apparent shortening, walking about with a weight attached to the foot, with a view to dragging it down; this appears to me, however, to be ordered on a perfectly wrong principle. If you attach a weight to one foot while he stands or walks, the patient is obliged to raise the pelvis on that side in order to balance the body, thus actually aggravating the defect you wish to remedy. But the same means will be very effectual when the patient is kept in the recumbent posture; either lying in bed, or, if the disease permit, resting upon a sofa, and the limb is gradually brought down, and the spine also improved, if lateral distortion has commenced from the elevation of the pelvis on one side.

In the second form also (in which there is actual shortening, and the remaining part of the head of the bone is situated on the dorsum ilii), if extension be continued for some time by a weight, the lymph by which the bone is retained may become elongated, some of its attachments may be loosened, and the head be brought down, so that instead of being situated high up on the dorsum, it may come to occupy a situation close to the acetabulum; and here it will be fixed as firmly and as strongly as if it had

been allowed to remain in the situation in which the contraction of the glutei first placed it. Of the good effects of extension in these cases, I have seen several instances, when the exact time has been chosen, when the part is quiet after the disease, but has not yet been firmly and permanently fixed in its new situation. When you have done all the good you can obtain by this traction, and the parts have become firmly fixed in their new situation, a high-heeled shoe may be worn ; and it is better, when the shortening is very great, not to have it made to raise the foot quite so high as to prevent all obliquity of the pelvis in after life, but rather to divide the necessary deformity between the limb and the spine, not allowing so much lateral distortion of the spine as would result from a shoe of the same thickness as the other, nor yet ordering such an immense thickness of shoe as would allow no twist whatever in the spine, but would at the same time attract too much attention to the shoe.

Thirdly, in those cases in which the head of the bone is suddenly thrown out from its cavity, it is very seldom that you have an opportunity of being of much service : you cannot, while the disease is still active, employ the force necessary to be used as in common dislocation, and the socket soon becomes filled up. The dislocation may escape observation also, and thus you will be prevented from rendering assistance.

A curious case of recent dislocation came under my care last year, which some of you may perhaps remember, which was rendered very obscure from the effects of former disease, and which may deserve your attention for a short time, in connection with the subject of shortening from disease of the joint, as it was much benefited by extension.

Eliza Britchford, æt. 22, was admitted on July 30th, 1846, into Drummond Ward, with the following history and symptoms:—Eleven years ago, she was in the hospital complaining of pain in the knee, of which she was cured ; ever since, the left leg has been the shorter of the two, and she has been in the habit of supporting herself upon the right, which may account for the obliquity of the pelvis, the anterior superior spinous process on the right side being a good inch higher than that on the left. Two months ago she was kicked upon the left hip, which has since been causing her some pain ; a week ago, she fell down stairs, the left limb being, as she expressed it, “twisted under her.” Since this last accident, she has been unable to walk, and the pain in the hip has been such as altogether to prevent her lying upon that side. The foot does not appear to be turned either outwards or inwards, and the limb, from the spinous process to the knee, is about half an inch shorter than the right ; the limbs are separated, and very severe pain is produced by any attempt to approximate them. When standing, the body is bent forwards, and the knee advanced, giving to the leg all the appearance of lengthening, while, in whatever position she may be placed, the sinking of the trochanter and the

flatness of the hip, both anteriorly and laterally, are conspicuous. On careful examination of the pelvis, no erepitus can be detected.

Here, the pain in the knee was probably caused, as it often is in children, not by disease of the knee-joint itself, but by an affection of the hip; and the latter part of the notes which I have read, forms a curious instance of the presence of some of the symptoms of dislocation into the thyroid foramen, with the absence of an important one which ought to have been present, namely, lengthening of the limb. The limb was abducted, and incapable of being brought to the opposite side, but it was shorter instead of being longer, as it ought to have been: this could be accounted for by there having been previous disease in the joint, succeeded by some shortening from absorption of part of the head, or imperfect growth of the whole bone; so that, although the recent accident might have produced some lengthening, yet it was not sufficient to bring the two limbs on an equality as when the two thigh bones are of similar length. In a consultation with my colleagues, we thought there was a sufficient absence of prominent symptoms of disease of the joint to make it probable that there was a recent dislocation, and, therefore, to warrant an attempt being made to bring the head of the bone back into its place. After having placed her, therefore, under the influence of tartarized antimony (a medicine which in these cases will perhaps be superseded by the ether, which latter remedy will certainly not be attended by the risk of exciting inflammation of the stomach, as happened to a patient whose hip I reduced some months ago, after giving him about six grains of tartarized antimony before a little nausea was produced), extension by means of pulleys was employed, and our notes for the 31st are—"Very considerable extension was made for about an hour, without any apparent alteration in the position of the bone, although, from the grating sensation which was more than once communicated to the finger, there was reason to believe that some alteration had taken place; but this sensation was never adequate to what one would expect from the sudden adjustment of the head of the femur into its socket. The sinking of the trochanter and the flatness of the hip appeared to be lessened, and she could directly move the limb, and bear their approximation much better." The benefit from this was most apparent. On the next day we read—"Has certainly increased power over the limb, and none of the difficulty or pain before experienced in drawing the left knee to the right." Nine days after—"Had a little pain in the knee yesterday and to-day," and leeches were ordered to be given. The leeches relieved the pain; and the notes for the 10th are that "the limb moves easily in any direction, but much flexion causes pain." And a week after this she left the hospital, with a tolerably good use of her leg, walking nearly as well as before the accident.

This case is in some respects remarkable, as affording an instance of the

difficulty in detecting the nature of a recent accident produced by disease occurring at a remote date, which might have remained unrelieved, with permanent lameness, if unrecognized, but which fortunately admitted great benefit from surgical means, the dislocation being reduced.

[*Medical Gazette*, vol. v., new series, p. 58.]

CLINICAL LECTURE ON HOSPITAL GANGRENE.

May 10th, 1847.

THE subject which I intend to bring under your notice, is one connected with many interesting particulars, and also not very often seen, namely, "hospital gangrene."

Let us begin by defining what it is—what is meant by the terms hospital gangrene, phagedæna gangrenosa, gangræna nosocomialis; for it has been called by all these names. I may best explain, by describing three forms under which destruction of parts may take place in a wound or ulcer.

First, then, by *phagedenic ulceration* you will understand a state of things in which there is a removal of parts by ulceration, without sloughing, the ulcerative predominating over the reparative process, and progressing sometimes rapidly and extensively; the ulcer having a jagged edge (putting on, as the name implies, an appearance as if bitten away); having a surface, not smooth, but both it and the margins being uneven and irregular; the ulcer being generally superficial, but sometimes deepening in proportion to the extension of the surface of the ulcer. It occurs under different circumstances. In scrofulous persons it may continue for years together, affecting the arm or the leg, or attacking the nose and face; in which latter situations it goes by the name of "scrofulous lupus." In these cases it is connected with some peculiarity of the constitution,—not simply scrofulous, however, for it is a disease of only rare occurrence,—while other evidences of the strumous diathesis are, as you know, exceedingly common. It often occurs also in connection with the poison of syphilis or of mercury, and you see it affecting both primary and secondary sores; frequently, when occurring with the latter, going on and spreading for months at a time, and, with intervals, even for years, irregular in shape, and healing sometimes at one part and spreading at another: and you may see a large surface covered with a thin irregular cicatrix, the consequence of such ulceration. Phagedenic ulcers sometimes spread much more rapidly, however, as in cases of enlargement of the absorbent glands in the groin, in patients debilitated by mercury and syphilis, going more deeply than in secondary sores of the skin; and the ulcer of a bubo in a few days becoming as large as the palm of the hand, and sometimes ending in the patient's death by opening some large artery; and

where the superficial course of the femoral artery exposes even that vessel to great danger, or some of its branches, which bleed largely from direct communication with the trunk. Here also is a poison, not directly causing the rapid extension of the ulcer, but meeting with some peculiarity of constitution, perhaps the effect of intemperance, perhaps the use of mercury, and the combined influence of these causes producing phagedenic ulceration.

Secondly, we have the *gangrenous ulcers*. In these there is no distinct well-marked ulceration, but the extension of the ulcer takes place by the parts affected at once losing their vitality. You may every day see an ulcer of the leg putting on a sloughy appearance, becoming healthy again, again changing its nature into an indolent or irritable ulcer: but occasionally a common ulcer becomes gangrenous, its surface becomes covered with a black or dark brown slough; the margin of the skin, to the distance of perhaps one-third or half an inch, black and dead, and the cellular tissue adjoining infiltrated with serum, swollen and puffy, and the surface of the skin for some distance around the ulcer of a dull livid hue. The sloughs easily separate from the other parts from their softness, and next day perhaps a further line and deeper surface of slough is seen, and thus the ulcer goes on rapidly increasing in depth and circumference, with great loss of substance from death of the infiltrated parts; with an exceedingly foetid discharge, and with the possibility of its proving fatal to the patient in the same manner as in the last form; and this state of things is attended by much pain and fever, and prostration of strength, and yet, perhaps, when the morbid action has ceased, the exposed surface becomes healthy, and quickly heals.

One peculiar form of gangrene may be called the "painful gangrenous ulcer." I have not seen an example for some years, but formerly at the Lock Hospital I had frequent opportunities of watching the disease, and now and then since that time. It occurs chiefly in low prostitutes; not connected with any syphilitic taint, but depending probably upon the excess in spirits and excitement of various kinds to which the irregular mode of life of these persons exposes them. It commences generally upon the nates, with a small black painful spot, and, in so short a time perhaps as four days, extends over a surface eight or nine inches in circumference and three inches deep; apparently, that is, for the great swelling and elevation of the margins cause the sore to appear very deep and large, while after the slough has separated a healthy ulcer is left, perhaps of not half the size it was, while the several tissues were filled with blood and serum. Another peculiar form of gangrene of a fatal kind takes place in the same situation as this, about the pudenda, in young children, and is often fatal.

Lastly, there is the *sloughing phagedæna*, which consists of neither the first nor the second variety simply, but it is formed by a mixture of both; there is some ulceration and some sloughing, and by the combined effect of the

two processes, the ulcer spreads rapidly in a few days. Sloughing phagedæna shows itself chiefly in two forms, not essentially different from each other, though unlike in appearance. Of this form of ulceration there have been two or three instances lately under my care, which have shown you both varieties of sloughing phagedenic ulcer.

One of these was seen in Richard Hilditch, æt. 41, who was admitted on April 7th into Fitzwilliam Ward, with, as our notes inform us, "sloughing excavated ulcers on the right leg, one on the outer side being as large as the palm of the hand. The whole leg is œdematous, and the ulcers have been slowly increasing in size. He has lived well, but regularly."

On the 8th, I ordered green dressing (a balsamic stimulating application), with water dressing over it, to be applied to the sore; and put him upon ordinary diet. He had also some enlargement of the heart, with much cough, which of course made the circulation of the legs less healthy, for which he was placed under the physician's care.

These sloughing ulcers presented nothing that is not seen every day; but a change soon took place.

16th.—"Ulcers are more painful and inflamed, bleeding and sloughing, with the edges ragged.—A stale beer poultice to the sore."

17.—"Pain not so violent; ulcers looking more healthy; pulse feeble and intermitting."—*Spiritus Vini Gallici*, ℥vj . quotidie. *Pulv. Opii*, gr. $\frac{1}{2}$. o. noct.

On the 18th.—"Has had rigors, followed by sweating. Bowels not open; ulcer painful, with the surface sloughy, and discharge foetid."—*℞ Lotionis Plumbi*, *Oj.*; *Ext. Conii*. ʒj . ft. *Lotio ulceri* applic.

℞ Tr. Opii, ℥xx. ; *Spiritus Ætheris Nitr.* ℥xv. ; *Ammoniae Sesquicarb.* gr. v.; *Misturæ Camphoræ*, ʒiss. *Fiat Haust.* 6tis horis sumend.

19th.—"Passed a comfortable night; ulcers more healthy, and less painful. Feels altogether better."

22nd.—"Sickness, which has been present for the last day or two, has ceased. Ulcers much cleaner, with less redness around, and the discharge no longer offensive."—*Tr. Opii*, ℥x. tantum.

24th.—"Ulcers quite clean and granulating."

26th.—"Ulcers not so healthy, looking weak."—*Pilulæ Hydrargyri*, gr. iiij. h. s. *Haust. Rhei*, ʒj. cras mane.

℞ Aëdi Nitrici, $\text{℥}\frac{1}{2}$ ad. ʒj. ft. *Lotio ulceri* applicand.

30th.—A little bleeding from the granulations; ulcers cicatrizing at the edges."—*Tr. Opii*, ℥v. tantum.

May 3rd.—"No more bleeding; sores cicatrizing."

7th.—"One ulcer quite healed; the one on the outer side of the leg healing rapidly. Adjacent skin less red, and the sore not painful."

The report for to-day tells us, that a "blue sloughy spot has appeared in the centre of one of the ulcers." I have ordered green dressing to be applied;

and I have little doubt, from the state the man is in, that it will not spread to any extent. Now, you may remember, that in him there was at the time when the sloughing commenced, a sudden effusion into the granulations and cellular tissue below them, and into the skin about the sore, so that the whole swelled up with the appearance of an uniform whitish brown mass, without any distinct granulations or margins; there were no black sloughs, nor very rapid extension of the disease; and what little pus was secreted was thin, foul, and offensive. Rigors, sickness, and fever, preceded and accompanied the sloughing; but this constitutional disturbance is not always great. You saw that under the use of the remedies I administered, in a few days the unhealthy action was completely stopped, and the sores have since made rapid progress towards a cure.

Another example, but in a very much milder form, occurred in a young man in Wright's Ward, named Thomas Witeher, who was admitted on March 10th, with ulceration of the cartilages of the knee-joint, for which disease I was obliged to amputate at the middle of the thigh, on April 8th. The stump was at no time very healthy, yet it went on healing and contracting up to the 26th, when he complained of much pain—no more, however, than you often hear complained of in nervous persons; but, combined with it, there was a foul discharge, and he had occasional flushes. I therefore ordered him, *Haust Quinæ, ℥iss.; Magnesiae Sulph. ʒss. bis in die. s.* And on

April 29th, the notes tell us, "The stump is more healthy, and less painful. The discharge is not so foetid, but he looks pale, and has a loaded tongue."

On May 7th, it put on the same appearance as in Hilditch. There was the same puffy and indistinct appearance of the sore, with pain and infiltration of serum in the parts around; and the wound, which was the day before not the size of a fourpenny-piece, was now larger than a shilling. The bowels were relaxed, and I ordered him *Haust. Cinchonæ, ℥iss.; Confectionis Aromaticæ, gr. xv. bis die*, with *Friar's Balsam* to the sore; and this was followed by the best results, for the notes for May 10th are, "wound not at all sloughy:" and the stump has now, in fact, almost healed.

A third example of sloughing phagedæna, but differing in its appearance from the other two, was presented in the case of John Alexander, who occupies the bed opposite to Hilditch, and on whom I operated, about twelve months ago, for the removal of carious bones from the foot. After the operation he left the hospital, in consequence of bad health and threatened phthisis, but the disease returning in the bones which were left, I was obliged to amputate the leg, the wound healing by the first intention. When the stump had healed, he went out of the house for a short time, in order that the parts might get firm and consolidated for the reception of an artificial foot.

On February 7th, however, he was again admitted with, our notes say, "a rather large abscess in the upper and inner part of the thigh, about three inches below Poupart's ligament, with swelling and tenderness of the glands about the saphenous opening." I punctured the abscess, and on the 12th, in consequence of the enlarged glands projecting so as to obstruct the escape of the pus, I made a cross cut. I will not occupy your time by discussing the treatment necessary for such glandular enlargements, but will merely mention, that I was obliged to destroy them with troches, thus leaving a deep ulcer, which on April 9th was filling up, and looking healthy. On April 12th, the notes are, "Has felt sick and feverish."—*R* Pil. Hydrarg. gr. iij. statim sum. Haust. Rhei postea.

On the 14th, "Fever has subsided; ulcer not much improved."—*Repet. pil. et Haust.*

16th.—"Yesterday and to-day has complained of headache and nausea; ulcer more painful, and putting on a sloughy character,"—this being the same day on which Hilditch's ulcer became gangrenous.—*R* Ammoniae Sesquicarb. gr. vj. Tr. Opii, *℥*x.; Mist. Camphoræ, *℥*ss. 6tis horis. Bread poultice to the ulcer.

17th.—"Skin undermined at the edges; ulcer increasing; headache; tongue white; bowels confined; face flushed; does not sleep."—*Augment dos. Tr. Opii ad ℥xx.*

18th.—"Passed a more comfortable night; more eversion of the edges of the ulcer, and more redness around. Discharge very foetid; bowels not open." *Olei Ricini, ℥ss.; Lot. Sodæ Chlor. ad ulcer. applic.*

19th.—"Has been frequently sick; headache; tongue loaded; bowels open; ulcer looking more sloughy. Passed a bad night, and had much pain."—*R* Morphiae Acetatis, gr. $\frac{1}{2}$; Spiritus Ætheris Nitrici, *℥*xx.; Haust. Pimentæ, *℥*ss. 6tis horis. Spiritus Vini Gallici *℥*ij. in die. The ammonia to be omitted, and to have beef-tea and arrowroot for diet.

21st.—"Less redness around the ulcer, which is looking deeper owing to the separation of some sloughy portions; it is not extending in circumference; the surface is cleaner, and the discharge not so foetid; there has been slight oozing of blood."—*Liquoris Opii Sedativi ℥xx. Mist. Camph. ℥j. 6tis horis.*

22nd.—"Was restless during the night. There was hæmorrhage to the extent of two or three ounces from a small artery in the centre of the ulcer; bleeding was checked by the application of turpentine; hardly any redness of the adjoining skin; ulcer still looking sloughy; feels weak."—*Vini Albi ℥ij. in die.; Haust. Rhei ℥iss. c.; Conf. Aromat. ℞ss. mane.*

23.—"A little more oozing has taken place from the ulcer, the surface of which is cleaner."—*Eau de Brocchieri applied.*

24th.—"More hæmorrhage. Tinet. Ferri Sesquichlor. applied with success.

There is no redness nor hardness around the ulcer ; surface looking cleaner, with florid granulations, and a slight discharge of healthy pus."

26th.—"Ulcer quite healthy, and there has not been any return of the hæmorrhage. The saphena vein, and a branch leading to it, are exposed for about an inch and a half, and covered with granulations."—*Liquoris Opii Sedativi* ℥x. tantum.

29th.—"Pain on left side of chest, with slight cough ; darting pain on inspiration ; slept badly."—*Vide Medicum*.

May 7th.—"Ulcer healing slowly ; skin not undermined ; veins covered with granulations."—*Acidi Nitrici* ℥viii. ; *Aqua* ℥xij. ft. lotio ulceri applicand.

Now, you may have observed that in him there was no such rapid infiltration of the cellular tissue, no proper prominent whitish slough, as in Hilditch ; but that small black spots formed in the edges of the surrounding skin, some being as large as a pea, others half an inch or more in diameter. You saw, also, that these spots separated in a day or two after their appearance, that fresh ones formed, that these changes continued during several days, and that the surface of the sore was sloughy. You may have noticed, also, an inflamed circle around the ulcer, of a bright red or pink arterial colour, very different to the purple, dark, livid appearance around the sore of the man in the opposite bed. The extension continued also a much longer time, though it did not double the previous size of the ulcer.

These two forms are very distinct from one another ; not in their effects for they both cause rapid and extensive destruction of the affected tissues, but they differ in appearance, and in the change which takes place in the capillary vessels ; in both cases the parts die, but in one more slowly, with infiltration into the cellular tissue, and granulations of the ulcer ; in the other, the intensity of the inflammation (that is, the weakness of the circulation in the capillary vessels), kills some parts at once, so that black sloughs are formed with little or no effusion of serum within them ; and in a bad case one uniform black slough forms over the whole surface, affecting the sore and the margin of the skin, rapidly extending by a fresh circle, and fresh surface of slough, till the extent and depth of the sore are fearful, every texture giving way before the gangrenous inflammation. In Alexander, you saw that there was hæmorrhage from the ulcerated surface. This did not occur at the time when the disease was most rapidly spreading, for at that time the violence of the inflammation causes coagula to form in the small vessels, and they are thus effectually prevented from pouring out blood. But when the sloughs separate, or the sloughing phagedæna is progressing more slowly, this process does not take place to the same extent, and the vessels bleed every time they are opened by the ulceration. It is remarkable how much resistance the vessels offer to the ulcerative process. In this case you saw the trunk of the saphena vein with one of its tributaries extending

quite across the surface of the ulcer, and yet remaining uninjured, and prominent on the surface; for the hæmorrhage which occurred took place, as it often does to a great extent, from the small arteries. I operated upon a patient some years ago for the removal of a portion of necrosed bone from the leg. Five days afterwards, the wound took on ulceration of a sloughing phagedenic character, and hæmorrhage suddenly took place from the ulcer to such an extent that before the house-surgeon, who was only in an adjoining ward, could reach the patient, he had lost upwards of three pints of blood, and was quite blanched, the blood spouting up to a considerable height, so that the house-surgeon had no doubt it came from the popliteal artery having been bruised by the operation. I tied the femoral artery, and soon after the ulcer became healthy without the hæmorrhage recurring. The sloughing, however, came on again some weeks afterwards, and was attended by a return of the bleeding, and on coming to the hospital I found Mr. Keate endeavouring to find its source; as, however, some diseased bone was again exposed, it seemed better to amputate the thigh, which was done with success; and on examining the limb, I found that the bleeding had not taken place on either occasion from the popliteal artery, nor from any large vessel, but only from the smaller ones of the sloughing surface.

Although the vessels resist the ulcerative process at the time, yet they may be greatly weakened by it, as in the remarkable case from which this preparation was taken. A man in the Lock Hospital had sloughing phagedæna supervening upon ulceration connected with diseased glands in the groin. After he recovered, and the part had quite healed, he heard a snap in the groin on some exertion, and a swelling solid, elastic, and not pulsating, and altogether very obscure in its nature, was formed soon afterwards in the groin. It was cut down upon, and an attempt was made, at which I was present, to dissect it out, under the impression that it might be of a malignant nature. Upon reaching the tumour, some coagula were found in the cellular tissue, such as are sometimes presented by malignant disease, but it had no boundary, and the opening was closed. You may perceive that both the inguinal artery and vein had been torn across, and the ends separated to some distance from each other, blood having been diffused extensively about the groin, and the patient having died of irritation.

Such, then, are these three forms of ulceration—phagedæna, gangrene, and sloughing phagedæna; and it is to the latter form that the cases I have cited belong; one, as you have seen, easily yielding, one continuing for five or six days, and a third of longer duration, and complicated with hæmorrhage. Besides these, there have been several other cases in the hospital under the care of my colleagues; namely, one under Mr. Keate, two under Mr. Cutler, two under Mr. Tatum, and one under the care of Mr. C. Johnson; making, with my own, nine similar cases in the last two or three weeks. Of

my colleagues' cases the ulceration affected two stumps after amputation ; two were cases of necrosis, which have not been able to be operated on, on account of it ; one patient had a strumous ulcer in the nates, and another had an abscess in the axilla, and was nearly dying of the sloughing.*

Now the term "hospital gangrene" is a general term applied to the two latter of these varieties when they attack many patients at the same time ; and, although the instances you have seen have been all of the nature of sloughing phagedæna, which is the most common, yet when hospital gangrene attacks the patients collected together in a crowded institution, as in military or naval hospitals, it may consist almost entirely of the gangrenous form. In December and January last, in a corner of the quadrangle of St. Bartholomew's Hospital, there were ten or eleven patients affected with such gangrene, of a very rapid and dangerous character, and one patient out of the number died, and the surgeons of the institution do not remember its occurrence there before. Hospital gangrene has never appeared here to any extent ; I have occasionally seen instances of it here, and more formerly than of late ; but University College Hospital was visited by it in 1841, and the Middlesex in 1835.

Sloughing phagedæna, and gangrenous ulceration, constitute hospital gangrene, but is there anything peculiar in it ? Does it depend in any peculiar way upon the bad air of the hospital ? You have, I think, seen enough of the disease to convince you that it does not. In January last, at the same time that it existed at St. Bartholomew's, three cases were seen in Grosvenor Ward ; two were my own patients ; one of them, a young man named Bacon, admitted with scrofulous caries of the metatarsal bone of the great toe, which I afterwards amputated ; another a scrofulous boy with necrosis of the fibula, almost the whole length of which you will remember my removing by operation after he got well : and in both the gangrene had shown itself before they were admitted, and it lasted for several days afterwards. In going through the ward at the same time that these persons were admitted, I recognized the disease in another patient of Mr. Tatum's by the horrible fætor by which it was accompanied, and on inquiry I learnt that in him also it had commenced before he came into the hospital, and none of our own patients in the hospital were at that time affected. The term hospital gangrene is therefore applicable to the disease because it often affects many patients in an hospital, and not because it is dependent upon any peculiar circumstance connected with the hospital itself, except so far as any disease is made worse in an hospital. It is caused, I think, by the condition of the atmosphere at the time, and I have generally noticed it when the state of the air has been such as to cause erysipelas, and other diseases of a low type.

* Some other cases have also occurred since the lecture.

Still, there is no doubt that hospital patients, collected as they often are in very large numbers, are more liable to be attacked by it than private patients. You know that the bad air of our wards, by weakening the powers of our patients, influences other diseases, and renders them more dangerous. Compound fractures, for instance, are attended by much more serious consequences in hospitals than they would be in the country; the deteriorated air of the former giving rise to bad symptoms not likely to occur in the latter: and, as all our patients are exposed to the same influence, it is reasonable to suppose that phagedæna attacking them would be of a more severe character than when occurring elsewhere, on account of the weakened powers produced by the hospital air. For the same reason, also, we should be likely to have many patients attacked at the same time if there was a condition of the atmosphere to make this disease epidemic. In a paper recently read at the Medico-Chirurgical Society, the hospital gangrene at St. Bartholomew's four or five months ago was attributed to the intense cold of the winter succeeding a sultry summer; but by other persons it has been said to have occurred in very hot weather following severe cold: it is probable, therefore, that it occurs as an epidemic from any circumstances which produce debility of the system. The disease is, therefore, rare, and, when it occurs, generally mild, in civil hospitals, which are generally well regulated, and with the air as pure as it is possible for it to be under the circumstances; while in military hospitals, with their crowded and often ill-ventilated wards and insufficient supplies, it frequently commits the most enormous ravages, spreading to such a degree that every lancet puncture becomes a sloughing ulcer, rapidly increasing, especially when the minds and bodies of the wounded are lowered in tone by defeats, and too often proving fatal to those attacked.

Thus, then, hospital gangrene is sometimes *epidemic*. Is the disease also of an *infectious* nature? that is, is its spreading owing to peculiar emanations from the sores themselves poisoning the atmosphere? I think that it may be. I will give you the details of an experiment made by Mr. Blackadder, very often quoted to prove the contrary opinion. Some patients affected with hospital gangrene were placed by the surgeon under whose care they were, in beds alternate with those of patients having healthy wounds. Care was taken that there should be no communication between these patients, who were warned of the consequences, and none of these healthy wounds were affected. But this negative evidence is contradicted by positive experience. Look at this occurrence. Bergmann, in a French hospital at Leyden, at a time when hospital gangrene was spreading rapidly on the lower floor of the building, thinking that it depended upon the bad air of the hospital, caused an aperture to be made in the ceiling, thus establishing a communication between the lower ward and that above. In thirty hours the disease had appeared on the upper floor, the patients in which were previously unaffected,

and those were first attacked whose beds were nearest to the aperture made for ventilation.

I believe, then, that the foul secretions of the hospital gangrene may possess qualities capable of poisoning the atmosphere, and that, under certain circumstances, the air of an hospital may become contaminated, so as to make the disease from this cause *endemic*, when the condition of the hospital is such as to make the disease infectious. It thus becomes infectious, just as typhus fever may be made infectious: we admit the worst cases of it without scruple, into our wards, with no apprehension of other patients, in these large rooms, being contaminated, but let a number of fever cases be collected together, or even a few of them, in ill ventilated places, and the worst form of gaol fever may take place, by which judges and juries, and every one submitted to the infectious exhalations, may be affected fatally by them.

Besides being epidemic, and sometimes infectious and endemic, is hospital gangrene also contagious? Is it contagious, so as to be carried, by the sponges or other means, from one patient to another, when not infectious,—*i.e.*, when the secretions are not virulent enough to affect the air? It has been said by some that it spreads only by contact; and one of the recent cases at St. Bartholomew's was said to have been distinctly traced to contact of matter conveyed by a sponge. Doubtless the secretions of many diseases are capable of producing similar or analogous disorders in other persons by contact;—the pus of erysipelas, or inflamed cellular membrane, of a bad kind, will cause inflamed absorbents or erysipelas in those who injure themselves with it, as it poisons the blood of the patients themselves, and induces secondary abscesses. In the gangrene of the pudenda of female children you may see every surface with which matter comes in contact poisoned by it, and a fresh gangrenous sore formed, if care is not taken to keep the surfaces asunder; and in hospital gangrene the pus is equally poisonous, and requires to be washed off to prevent its spreading from this cause. A young woman was under my care, some years ago, who was attacked by phagedenic ulceration of the dorsum of the foot, which spread over the back of all the toes, so as to form one circular sore, with little distinction of the foot and toes from one another, because the toes lying in close contact when swelled by the disease, the secretion affected each in succession, when it touched another before it was allowed to spread round the toes to the bottom of the foot; she had three relapses of the disease in the course of six weeks. It would, therefore, be only reasonable to conclude (as experience seems to show) that the disease is contagious, and capable of being so propagated, if care is not taken to prevent the foul secretions from being carried from one patient to another.

But is there any proof that hospital gangrene is usually conveyed by either

of these ways—by both infection and contagion at one time, or by either of them exclusively?—I should say, decidedly not.

Two of my patients, we have seen, were attacked in opposite beds in the same ward, and another patient has had the disease in the same ward, or at least in the adjoining ward, under the same nurse; but then the other cases have been scattered about in various wards; some on the women's side as well as the men's, without any communication between them, and under a variety of nurses. Again, if conveyed by contagion, you might expect that one surgeon would have a great number, from carelessness on his part, or on the part of his dresser; but the cases thus scattered have belonged to all the surgeons, showing, therefore, that there has been a general cause in operation, affecting one patient in one ward and another in another ward, without anything like probable infection or contagion. Such has always been the case when I have seen several cases at one time; and in civil hospitals I believe communication of the disease by infection or contagion to be the exception and not the rule. If a person had come into the hospital in January last, and seen the three cases I have alluded to of hospital gangrene in one ward, while there were none elsewhere, he might have been inclined to have exclaimed, "there is the disease spreading by contagion by means of sponges,"—but then we have seen, that although all sent accidentally into this ward, all three of them were admitted with the disease already present, and admitted, too, from various parts of town and of the country, a general tendency to the disease being also shown by its occurrence at the same time at St. Bartholomew's. So, also, it is, I believe, at the present time, with the cases you have seen begin in the hospital. It is curious that all these cases have been in different parts of the upper floor, which one would expect to be the most healthy, from better air.

In one patient you have seen a circumstance which may occasionally be observed, namely, a healthy ulcer on one side of the thigh in a boy with necrosis, while others were spreading with considerable constitutional disturbance. Some persons have supposed, from this circumstance in part, that the disease is entirely local, but it is the exception and not the general rule, and commonly the state of system is seen to be bad before the ulceration or gangrene commences; and most of the ulcers in the same person, when there are several, are simultaneously or successively affected.

You have seen that two of the cases I have referred to more particularly were treated upon the same principle,—to each, opium and ammonia, with brandy and good diet, were given, while the sore continued in the sloughy state, and you saw that in one of them (Hilditch) the unhealthy action soon stopped. In the other patient (Alexander) more difficulty was experienced in getting the opium to produce its good effects. I tried the tincture, and afterwards acetate of morphia, and they were both followed by sickness and

headache, so that I was obliged to leave them off ; but the *Liquor Opii Sedativus* was found to agree. In the third case (Witcher) no opium was required, as the gangrene was only threatening ;—I increased, you saw, the strength of the tonic medicines he was taking, by giving him bark and aromatic confection, and omitting the saline purgative he was formerly taking with some quinine.

All you require in general, is, as far as the pulse and the inflammation round the ulcer will warrant, to give good diet with a moderate quantity of stimulus, more especially ammonia ; and opium in sufficient quantity to allay the pain. I alluded to a form of gangrenous ulcer which occurs in prostitutes ; I have been obliged, in these cases, to give as much as thirty or forty grains of solid opium in the course of the day before I could relieve the horrible pain which the patient was suffering. And in some cases of hospital gangrene, when the pain has been unusually severe, I have commenced with a dose of two grains, and have had occasion to repeat it every second hour, or even every hour for a few doses ; of course, carefully watching its effects, and going on with a smaller quantity as soon as the violent pain was subdued. But in the cases now in the hospital there is no occasion to use this remedy to the same extent ;—*Liq. Opii Sedativ. ℥xx. 6tis horis*, you saw, in Alexander's case, was sufficient to check the disease. A corresponding dose of the *Tr. Opii* sufficed for Hildich, in whose case I was enabled to discontinue it altogether in about five days, though in the former, I continued to administer it for a somewhat longer period.

The diet must be nourishing, but light and not solid, if the tongue be loaded, or there is great heat of skin ; and if this latter symptom be present, the ammoniated saline draught, with an excess of about five grains of the sesquicarbonate, and the opium, in the form of Dover's powder, will be the best mode of administering your remedies ;—when the state of the tongue will warrant, you may return to solid food. The pulse will guide you in the administration of brandy or wine, but the employment of these stimuli will not be often necessary at the commencement of the disease, although they may become useful at a later period, and in some cases no stimulus of this kind is required at all. The state of the bowels must be attended to, and a warm purgative, such as the *Haust. Rhei*, or a little colocynth, you will find the most appropriate means for regulating them. Mercury for this purpose is seldom indicated, though a small dose of blue pill or calomel may occasionally be necessary. In the employment of tonics you are to be guided by the condition of the tongue,—some of the preparations of bark, and bark combined with ammonia, are the best. You will see in the works of military writers venesection spoken of as useful, and you will see it stated that patients have requested to be bled, sensible of the benefit they have received from it. I never saw a case requiring it ; I never saw a case in which the

patient was not weak ; not always, it is true, bearing stimulants, but yet weak ; and I look to this depression as the chief predisposing cause of the disease.

With regard to local remedies—if the ulceration be purely phagedenic, or if it be attended with but little sloughing and is painful, soothing applications are the best. A drachm of the extract of conium to a pint of Goulard's lotion is a very good form of lotion, and was used in both of my patients ; and if the pain be very severe, you may add ℥xvi. of Scheele's Prussic acid. The solution of opium is uncertain in its effects, and often aggravates instead of allaying the pain of an ulcer. Sometimes you will find plain water answer better than medicated applications ; it may be applied cold if there be much redness around the sore ; it had better be used tepid, with oiled silk over it, if the ulcer be weak, and the redness not vivid. If the ulcer have rather more of a sloughy character, stimulants will often rouse the vessels to a healthier action, and so do good ; in the same manner as they are serviceable in cases of severe burn. The Peruvian balsam may be used, or the Tinctura Benzoë C. ; and they must be thoroughly applied, so as to come in contact with every part of the ulcerated surface ;—or the green dressing—Unguentum Elemi Compositum, mixed with Balsam of Copaiba, may be employed. A stale beer poultice acts in the same manner ; it did no good, you may have observed, in Hilditch. Great advantage is sometimes obtained from the ebullient lotion, a drachm of the strong solution to fifteen of water. This, applied over the surface, often stops the disposition to slough, and has the additional advantage of correcting the great factor by which the disease is sometimes accompanied. It is when the sore is but moderately sloughy that the charcoal poultice, or one of Port wine, may be useful ; they are but seldom used now, though often applied formerly.

In the third form, not phagedenic, nor sloughing phagedenic (the mixed form, that is) but gangrenous, the gangrene sometimes spreads so rapidly that unless it be stopped at once it may be attended with the greatest danger to the patient. Various applications have been used to destroy the whole surface next to the gangrenous textures, and consolidate the parts underneath the sloughs while they are separating, so that a healthy surface may be exposed when the dead portion comes away. The actual cautery has been much used for this purpose, but in this country it is not much used, nor do patients much like it, though it is an effectual remedy sometimes. I do not like the lunar caustic, it does not penetrate sufficiently deep ; nor do I like arsenic, which some have employed ; it is far too dangerous when applied to a large surface. The strong mineral acids are the best ; the nitric or muriatic, for instance. The former is most used, and may be applied by means of a piece of wood, taking care to touch every part of the sore, so that the whole of the living part beneath may be affected by it : watch when the

slough separates, lest there be any part left with a disposition to slough remaining ; if there be, apply the acid again. None of our patients, I believe, have been bad enough to require this plan of treatment, which is a painful one ; nor do I ever use it in sloughing phagedenic sores, but it is invaluable in the gangrenous form of disease.

By one or other of these means you may generally check the disease, and almost always prevent a fatal result. I never saw death occur, I believe, in any case of hospital gangrene ; one patient of mine, however, was carried off, soon after the gangrene ceased, in consequence of an attack of erysipelas. In this man there were two parts of the body affected at the same time, and in each there was a different variety of ulceration ; he had a phagedenic ulcer in the groin, with a little sloughing, and a rapidly extending gangrenous sore on the leg ; the latter I stopped by applying nitric acid, not, however, before it had exposed the bone and destroyed some muscle ; the other got well without any such application. This difference is an occurrence you not unfrequently see, and it arises from the parts near the centre of the circulation possessing a greater vitality, than those more remote, the latter being, therefore, the worst. When the disease has ceased, the ulcers may be treated in the common way by various applications ; diluted nitric acid was used for each of our two patients, and agreed well,—so will sometimes solution of caustic, or red wash, or black wash, or whatever else seems appropriate to the condition of the ulcer.

[*Medical Gazette*, vol. iv., new series, p. 1024.]

CLINICAL REMARKS ON HOSPITAL GANGRENE,

WITH THE REGISTRAR'S REPORT OF FIFTY-SIX CASES IN
THE YEAR 1853.

Charles Howe, 25 years of age, was admitted the day before yesterday, Jan. 22, having been a patient, in the first instance, on the 31st of Dec., for a contusion and laceration of the great toe, which was occasioned by a waggon crushing it ; the nail was loosened, and the toe inflamed ; but he left the house nearly well on the 7th of Jan. In the last few days he has had more walking than usual, and the toe became swelled and inflamed, with very great pain, and the skin was dark and livid around the wound at the root of the nail, which presented an appearance of threatened phagedæna, or sloughing phagedæna, and there was also a red spot the size of a half-crown over the metacarpal bones. He appeared to be of a good constitution ; and had been lately living well on meat, but without porter, to which he was before accustomed. His tongue was very thickly coated. The

house-surgeon gave him a dose of calomel and Dover's powder, with ammoniated saline mixture, containing three grains of Dover's powder every six hours, and applied some goulard and laudanum as a lotion. Yesterday, when I saw him, his pain was much lessened, and the toe, I am informed, looked much less swelled. I continued the saline with some sedative solution of opium, and I conclude he will escape the danger with which he was threatened of spreading ulceration or gangrene.

You have seen also in the hospital a man, 44 years of age, William Quinn, who was admitted on the 29th of December last. He was riding on a tram-carriage, when the starting of the horses threw him off upon his head, producing a small scalp-wound, for which he attended as an out-patient. The wound became phagedenic however, and on this account he was admitted on the third of this month; the wound being dark green from threatened sloughing, but not extending deeply. He had been living well,—if taking beer and gin sometimes to excess can be so called. A purgative of calomel, and colocynth, and opium was given to him; and on the 6th the wound was looking better, and plain water dressing alone was required. On the 9th, however, he had shiverings, and the wound was again unhealthy, and much more swelled than before, and had a sloughing surface, and he complained of rheumatism, probably the general pains of fever. His pills were repeated, and he had saline and opium, and chlorine wash with a poultice. On the 11th, the edges were phagedenic, and a goulard and hemlock lotion was used, which is very useful in common phagedæna. On the 13th, the scalp was still œdematous around the wound, but the ulceration scarcely spreading. He was now free from fever, but weaker; and his saline was omitted, and wine and bark were given, with porter and meat. On the 20th all swelling was gone, and the sloughs had come away, leaving the bone exposed to the extent of about an inch and a half; and yesterday the size of the sore was less, and the part quite healthy.

Such is the history of two cases of an affection of which so many instances have been seen in the last few months at the hospital, and of which several, I believe, are now in the house. I had intended to have made a few remarks to you on the subject of phagedæna, sloughing phagedæna, and hospital gangrene; but, on looking at a published clinical lecture of mine, delivered when it prevailed on a former occasion, I find that it contains nearly all that you can require to know of this disease as civil surgeons, and I will therefore content myself with referring you to this lecture, with a request that you will read it in the *Medical Gazette*, June 11, 1847 [*ante*, p. 214], at which time, as well as at present, some other hospitals had the same disease, though not to the same extent this year as ourselves.

I have made some inquiries, however, as to some points, on which our excellent Registrar, Mr. Holmes, has given me a report, which appears to

me to contain some matter of considerable interest, connected with the epidemic of the last year. In the lecture I have spoken of, I expressed an opinion that the hospital gangrene of that period was epidemic and not proper to the hospital, although circumstances might very possibly render it endemic; and in the present attack of the disease the same reasoning will hold good.

It appears, that the number of cases of phagedæna and hospital gangrene admitted into the hospital was 23, and that the number of cases which originated in the hospital was 33; and of these 56 cases, 15 are marked as sloughing phagedæna, and of these 8 were admitted with that form of the disease. It is quite clear, therefore, that there was some general cause in operation, atmospheric, or whatever it may be, external to our wards as well as within them, in consequence of which many patients from different localities were affected with the disease; and, although it is not surprising that even a greater number should be seized while residing in the hospital when we consider the number of operations and of wounds of various kinds liable to be invaded by such an epidemic, and the depressing effects of illness and hospital air on the constitutions of the patients, yet it is a remarkable fact that the proportion of the worst cases, *i.e.*, of the sloughing form of the disease, is reversed, 8 of such cases having been of that nature out of the 23 admitted, while only 7 cases occurred out of the 33 attacked among our in-patients.

But, in the next place, of the 23 cases admitted with phagedenic disease, 2 died, which is about $8\frac{2}{3}$ per cent.; while of the 33 cases originating in the hospital, no less than 5 died, which is rather more than 15 per cent.; and of the 15 cases called sloughing phagedæna, 4 died, which is $26\frac{2}{3}$ per cent.

So that this epidemic has carried off as many as 7 patients out of 56 cases under the care of all the surgeons; while, in the epidemic of 1847, I do not remember that any patient actually died, though a few had a very narrow escape.

The following were the causes of death, and the nature of the original wound, in the seven who died:—

1. Sloughing phagedæna of a sore near the elbow, communicating with caries of the humerus. He had recently undergone amputation of the leg, the stump not becoming phagedenic; and he had symptoms of pyæmia, but no very distinct post-mortem appearances.

2. Spike-wound of the foot—spreading phagedæna. Died apparently of pyæmia, with phlebitis of the veins of the leg.

3. Idiopathic abscess near the knee. Hospital gangrene. Hæmorrhage from a large branch of the popliteal artery, for which amputation of the thigh was performed. Died the same day of secondary hæmorrhage.

4. Lacerated wounds near the knee. Hospital gangrene. Died exhausted,

with hectic fever, after the sloughs had separated and the wounds had become clean. No visceral disease nor contamination of the blood.

5. Syphilitic eruption, ulcerating. Phagedæna of the ulcers. Died of pyæmia. Secondary deposits in the lungs.

In these 5 cases, the phagedæna commenced in the Hospital; in the two others, it began before their admission.

6. Admitted with sloughing phagedæna, after a lacerated wound of the leg, from the kick of a horse. Tibia exposed largely by the sloughing, but the wound left healthy. Died of pyæmia; phlebitis of the veins of the leg. Secondary deposits in the lungs.

7. Admitted with phagedæna of a scalp-wound. Secondary suppuration in the diplœ and subarachnoidean tissue, and secondary pneumonia.

Believing, as I have mentioned, that phagedæna, like typhus fever, may be rendered endemic by concentration, and by other favouring circumstances, I endeavoured to ascertain whether this appeared to have been the case in any part of the hospital; but the cases attacked were too widely scattered in all parts to make it seem probable. The report says, indeed, that the wards which have been most severely attacked were Grosvenor and Fitzwilliam, in each of which 6 cases originated; but, in the former ward, 2 cases occurred early in the year, before the disease had become epidemic, and were not followed by any others; and most of the operation cases on the men's side are in these wards.

The widely-scattered position of the different cases appears also to negative the supposition of the disease having been conveyed by contagion by means of sponges, which were hardly used indeed; and cases having originated, as well as having been admitted, under each of the four surgeons, is against the supposition of the disease having been conveyed by one of the dressers, or by other persons, from one patient to another.

At the same time, there is no doubt, in my opinion, that the disease might be so propagated. No one can think otherwise who has seen a case of hospital gangrene on the hand or foot, in which the fingers or toes are held together. Beginning on one of them, it will spread to the adjoining fingers or toes where the pus or sloughs touch them, instead of going round them; so that a single circular sloughing surface will be seen affecting the back of all the five fingers, while the sides and palmar surfaces are not even swollen or red. You may see exactly the same thing in the sloughing pudenda of children, in whom a fresh slough occurs, when any two portions of skin or mucous membrane touch each other. In fact, all diseased secretions of the human body are poisonous, as nurses and washerwomen constantly experience, as well as the members of our profession. I remember one of our house-surgeons who had three distinct attacks of erysipelas in his year of office from inoculation; and, as it happened, two of them were from opening

the bodies of patients who died of erysipelas. Not because he caught erysipelas, as such, from the inoculation, but because he was a delicate, weakly person, in whom this disease was likely to occur from inoculation with any morbid secretions.

You might expect, *à priori*, that more men would be exposed to the causes of phagedæna; and, accordingly, it appears that, of our 56 cases, 45 were in males, including 3 children, aged 3, 4, and 7 respectively; while only 11 were in females, including 1 child, aged 7 years.

Of the 4 cases which originated in children, 1 was admitted with the disease, 2 originated after surgical operations, and 1 after a burn; none of them died.

The number of cases which originated after surgical operations in the house was 9; 3 after amputation (of the thigh, leg, and fingers respectively); 1 after operation for hernia; 1 after venesection; 1 after excision of a fatty tumour; 1 after removal of a sequestrum of bone; and 2 after simple incisions; and these 9 cases were distributed over seven different wards.

You might suppose that the temperature of the atmosphere would influence the production of the disease; and I distinctly remember the commencement of the epidemic immediately after some very hot weather. I have inquired into this matter, and the report says:—"As to the time of commencement, 7 cases occurred sporadically during the first six months of the year; but the regular attack may be dated from the beginning of July, in which month phagedæna showed itself in five of the wards, at opposite ends of the house, and on different floors, during the three days—the 7th, 8th, and 9th of July. The temperature of these days in the Registrar-General's Report is marked as 7·2, 6·8, and 0·8 deg., above the average. The temperature of the wards also was high, ranging between 71 and 76 deg. at mid-day.

But then, on the other hand, besides the two cases now under our observation, others of the same kind have occurred lately, the temperature in the month having been observed at 6 deg. below zero! In the lecture I have recommended to your perusal, you will also see it mentioned, that an epidemic attack of this disease began in St. Bartholomew's Hospital in the cold season—in December and January; so that I must still think, as I said then, that either extreme of temperature may perhaps give origin to the disease, by depressing the general strength of our patients who have any wound or ulcer.

[*Medical Times*, February 18, 1854.]

RUPTURE OF THE DIAPHRAGM FROM ACCIDENT.

THE specimen was taken from a man, aged 24, who was admitted into St. George's Hospital, having fallen from a height of about twenty feet. He had fractured both arms, and sustained other injuries. On the day after

admission he complained of a fixed, defined pain on the left side, a little below the hypochondrium; this was accompanied with slight hæmatemesis, and inability to take food. He appeared to progress favourably till the ninth or tenth day, when a sudden prostration supervened, from which, however, he rallied. Similar collapse again returned, after a few days, and continued to do so at two or three distinct periods, till about the tenth week, when he was seized with pain in the abdomen, and constipation, followed by diarrhœa, and the passage of blood by stool. This was succeeded by an acute attack of pleurisy, from which he died in the thirteenth week after admission. He was nourished with enemata from the time of the injury to his death, the incapability of taking food by the mouth continuing without intermission.

The entire surface of the abdominal cavity appeared, on the post-mortem examination, quite black; and at the lower part was observed a large cyst among the convolutions of the intestines, which contained pus and fæcal matter, and communicated with the lower part of the colon. The left pleural cavity presented evidence of very acute inflammation, there being two distinct circumscribed effusions, the one at the upper and the other at the lower part of the cavity. The latter was situated between the lower portion of the lung and the diaphragm, which presented a distinct laceration of about an inch across; and through this opening the abscess communicated with another in the abdominal cavity behind the stomach, and bounded also by the spleen and kidney. It contained about half a pint of pus. There was a further laceration, of about six inches in length, in that part of the diaphragm forming the wall of the abscess, which, however, did not appear to have been perfect.

The symptoms exhibited by the patient had led to a correct diagnosis of the injury sustained. The case was of great interest as regarded the period of time the man had survived the accident.

[*Pathol. Trans.*, vol. i., p. 123, January 18th, 1847.]

FATAL CASE OF ULCER OF THE DUODENUM AFTER A BURN.

THE influence of a severe burn upon the mucous surface of the intestines has been well known since Dupuytren first pointed out the existence of great congestion in such cases; in consequence of which observation many cases of ulcers in the duodenum have been since discovered.

Mr. Samuel Cooper recorded two such cases, about twelve years ago. Mr. Long had described some others in a paper on the general effects of

burns. Mr. Curling had described six others in the *Medico-Chirurgical Transactions*, one of which had been observed at St. George's Hospital, and some cases occurring in the same hospital had been published in the *Transactions of this Society*, by Mr. Hunt. Of the connection of such ulcers with burns there could then be no doubt, though why the duodenum was especially selected in preference to the other small intestines, did not appear very plain; still less, why the upper part of the duodenum alone, close to the pylorus, was the part in which they were almost always found.

In some cases, there appeared to be no sign of the existence of these ulcers during life, but in many others they proved the immediate cause of death, producing pain in the epigastrium, and vomiting, and terminating fatally, sometimes by ulcerating into the peritoneum, sometimes by hæmorrhage. In the latter case blood may be brought up by vomiting, or passed in the evacuations, or discharged in both ways; and in one instance related by Mr. Cooper, blood was found between the stomach and colon, after ulceration had taken place through the peritoneum. The fatal result of these ulcers seemed to take place at very various ages, though generally in young persons, and also at very different periods after the accident. With regard to hæmorrhage, it is singular that while it occurred in six out of ten examples seen or collected, by Mr. Curling, the case now before the Society is the first in which Mr. Hawkins had himself known it fatal.

The subject of the disease in the present instance was a little child, six years of age, admitted after a burn of the arm and upper part of the body, and side of the face. There was some collapse at first, after which the child seemed to go on pretty well for four days, but just after the expiration of the fourth day it became suddenly faint and weak, and died on the following morning, exactly four days and a half after the occurrence of the burn, having been, as far as was known, in perfect health before that time. There was no vomiting of blood, or discharge by the bowel, so that when Mr. Hawkins found it had died, he was at a loss to account for the fatal collapse at this period after the accident. On looking for the existence of an ulcer in the duodenum, as he usually did, he found this part full of blood; and many other parts of the small and great intestines, down to the rectum, contained also some blood.

In the upper and back part of the duodenum, very near the pylorus, may be seen an ulcer, which appears smaller from the contraction caused by its immersion in spirits, but which, when first examined, was about an inch and a quarter long, and nearly three-quarters of an inch in breadth. It had exposed the muscular fibres at the lower part, but nearer to the pylorus it may be observed to have gone through this coat towards the pancreas, and crossing the ulcer may be seen an artery—a large branch of the pancreaticoduodenalis close to its origin. This has now a bristle within it, but could be

seen by the eye as if half of the vessel had been cut off for half an inch of its course : the artery had doubtless been the source of the sudden and fatal hæmorrhage.

Mr. Hawkins remarked that he had looked through the dates of the fatal result of these ulcers, and found only one which approached to the rapidity of the present case ; it was one of those recorded by Mr. Cooper, in which vomiting of blood had been noticed on the sixth day, and the child died on the seventh day ; while in Mr. Hawkins's case the collapse took place just after the completion of the fourth day, and in four days and a half from the occurrence of the accident the child was dead.

[*Pathol. Trans.*, vol. ii., p. 290, May 20th, 1850.

LARGE HERNIA IN INGUINAL CANAL.

To the Editor of the London Medical Gazette.

SIR,—An interesting case of hernia having been published in your last number, by Mr. Earle, I am induced to send you the following account of a case somewhat resembling Mr. Earle's, but differing in other points, which is perhaps, sufficiently unusual to deserve record.

Wm. Mills, æt. 28, was admitted into St. George's Hospital, under my care, on the 9th of last month. He had had an inguinal hernia on the right side for several years, for which he had worn a truss. He had been ill the few last days, having been bled two days previous to his admission for a slight pleuritic attack. In the evening of the 8th the hernia came down. A purgative was administered, and attempts were made to reduce the hernia, without success. On the morning of the 9th, fresh attempts were made by Mr. Chinnock, under whose care he had been placed, to return the bowel ; complete syncope having been induced by the abstraction of 40 oz. of blood. He was sent into the hospital in the evening, and kept in the warm bath for an hour and a half, losing 10 oz. more blood ; but the hernia still remaining unreduced, I was sent for about twelve o'clock at night.

I found him with a tumour not very tense, and the tension rather less than before he was placed in the bath ; some pain and tenderness in the swelling, and a little also in the abdomen. He had not had any evacuation since the descent of the hernia ; there was slight nausea and sickness, and a little hiccough, but no anxiety of countenance ; and the pulse quite soft, and 108.

The tumour was about the size of a large goose-egg, not descending into the scrotum, but having the appearance of spreading out above the abdominal muscles, so that the external ring could not be felt. The testicle had never descended, but I thought it could be felt at the lower part of the swelling.

As the symptoms were not very urgent, and the hernia an old one in which the progress of the strangulation is generally slower than in recent cases, I determined to try the effects of the tobaccoe clyster, which was accordingly done, but still unsuccessfully. He was then left till the effects of the narcotic had subsided. Believing that delay is more dangerous than the operation itself, I regretted having employed this powerful, though uncertain remedy. It is probable, however, that the whole time which elapses between its administration and the time when the operation can subsequently be performed, ought not to be considered as lost, since the inflammation can scarcely proceed so rapidly while the person is under the influence of a narcotic, as under other circumstances; and the state of the bowels, at the time of the operation, showed that the delay was not attended with much increase of risk.

10th April, at 7 a.m. I proceeded to operate, the symptoms being the same as the preceding night.

On cutting down to the tumour, I found that the external oblique muscle, and the edges of the inner muscles, completely covered the sac, so that these required to be divided before the sac was exposed, which was opened, and the neck of the sac divided. About twelve inches of bowel was found much distended with flatus, but in a healthy state, with the exception of some increase of vascularity. Some difficulty was experienced in returning the intestine, which I found to result from a tight band running across the upper part of the opening, about half an inch within the proper neck of the sac, and having the effect of making a narrow canal about three-fourths of an inch long. The nail only could be inserted between the bowel and this band, the effect probably of adhesion between two portions of peritoneum, and it was difficult to divide it, from the distension of the bowel and the depth of the part. The intestine was then returned. A large sac was now left, at the lower part of which was situated the testicle, which thus blocked up the external ring, and prevented the descent of the hernia through this opening. The vessels of the cord were seen running towards the testis, behind the peritoneal sac, which formed the loose covering of the testis, as in congenital hernia. The testicle and epididymis were loose in the sac, but the vessels being adherent to the surface of the iliac fascia, I was obliged to leave, the testicle in the wound. At noon he had less pain, very little tenderness and that only on the right side. Pulse 110; tongue moist and clean.

Enema commune statim.

Hirud, xv. Abdomini.

R Infus. Rosæ, ʒiiss. Magn. Sulph. ʒij. 2dis horis.

In the course of the afternoon he began to have motions, so that the mixture was left off at eleven o'clock, and the tenderness was quite gone. Slight nausea continued, and occasional hiccough.

12th.—He continued very well till to-day, when some pain and tenderness came on in the left hypochondrium. Pulse 104.

Hirud. viij. parti dolenti.

R̄ Hydr. Submur. gr. iij. Opii, gr. ss. M. hss.

Ol. Ricini, ℥ss. cras mane.

13th.—Pain and tenderness gone; wound nearly healed by the first intention.

On the 14th and 15th he had a return of the pain in the left hypochondrium, his pulse became quicker, and his countenance had an anxious expression. By the repetition of eight leeches twice, and the employment of small doses of calomel and opium, these symptoms were subdued, and he is now quite well.

This case resembles that recorded in your last number, in the situation of the intestine beneath the abdominal muscles, upon the transversalis fascia over the iliac vessels, in the depth of the neck of the sac and the difficulty of dividing the stricture, which, in both, had no reference to the external abdominal ring. But this case is peculiar from the sac having been entirely within the external ring, so as to separate the internal ring to a considerable distance from it, and thus rendering any efforts at the taxis necessarily unavailing, the force employed only pressing the sac, with its contents, against the posterior part of the abdominal parietes. The double stricture which had been formed at the internal ring is also remarkable, as, after the division of the neck of the sac, the second constriction could not be anticipated, and required the introduction of the finger to a great depth to discover it, and great caution in dividing it.

The performance of the operation in congenital hernia, where no separate tunica vaginalis is formed, is not uncommon; but the occurrence of a hernia so many years after birth, with the testicle not in the groin, but still, as it might be called, in the abdomen, is certainly not a frequent occurrence. It might be expected that the testicle remaining in the wound would be a source of irritation after the operation, and some surgeons have proposed the removal of the testicle; but as this was of its usual healthy size, I saw no reason for this practice; and the inflammation of the testicle itself, was in fact, very slight after the operation, while the removal of the testicle and its tunic—in other words, of a portion of the sac—could not but have added very materially to the patient's danger.

Every point of practice in this formidable disease being of importance, you may perhaps think the case I have related not unworthy of record.

I am, SIR,

Your obedient Servant,

CÆSAR HAWKINS.

May 1st, 1829.

[Vol. iii., p. 734.]

CLINICAL LECTURE ON HERNIA.

Given June 2nd, 1846.

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1. Incarcerated Inguinal Hernia—Suppuration. 2. Strangulated Femoral Hernia—Mortification of bowel—Extraordinary appearances after death (with diagrams).

WHEN mortification takes place in strangulated intestinal hernia, without the performance of an operation, the gangrene of the bowel is accompanied by putrid effusion into the sac, with inflammation of the sac and of the fasciæ and cellular membrane and skin to some distance over it, so that lymph and pus, with shreds of sloughy substance in several layers, are found under the skin ; the skin itself becomes at first hard and thick, and of a dark livid red colour ; the tumour becomes flaccid, and crepitates when in this sloughy condition ; and at last the skin becomes gangrenous, and an exit is afforded for the effused fluids and sloughs, and for the contents of the bowel above the strangulation, and an artificial anus is established. While these local changes are going on a corresponding alteration takes place in the constitutional condition, and the symptoms of strangulation alter, or become mixed with those which usually attend gangrene of any important part ; the sickness becomes mixed with hicough, and there is great prostration of strength, with cold clammy perspiration, and a feeble and irregular or intermitting pulse, and the patient gradually sinks.

Two cases have recently fallen under our notice which bear upon this important subject, and are very curious in themselves, besides suggesting many interesting points of practice, and I shall therefore bring them under consideration to-day.

The first of these cases is that of James Harris, 61 years of age, who was admitted on the 6th of May, with oblique inguinal hernia, irreducible and incarcerated on the right side, about the size of a goose-egg, situated above and to the inner side of Poupart's ligament ; hard, tender, and inflamed ; the skin thick and tense to some extent over and around the tumour, and of a dark red colour ; with resonance on percussion, and impulse on coughing. Though tender, it is not painful ; there is no vomiting, and his bowels were open this morning, and his pulse is regular.

He has had a rupture only a month, and cannot account for it ; he was not making any unusual exertion at the time, nor has he been confined to bed for it, previous to his admission. The rupture was not returned till last Monday, the 4th (that is, two days before his admission), and ten minutes after its reduction it came down again, and has continued so till the present time. An hour's attempt at reduction was made in the morning before his admission, which has much inflamed the sac.

Here, then, was a rupture in the inguinal canal, which had not passed

through the external ring, and in which no symptoms of strangulation existed; the bowel was simply irreducible, if, indeed, it was quite certain through the obscure sense of touch caused by a little fluid, which appeared to distend the sac, that there was actually any intestine within it, as seemed most probable; at any rate by itself it was no subject for operation in its perfectly quiet state. But then the appearance of the abdomen was very much like that which occurs when gangrene has taken place in a hernia; there was clearly much cellular inflammation below the skin, with some fluid in the sac or in the fascia over it, which the dark colour of the skin showed to be rather of a low character. It is true that this condition of the external parts might be chiefly or entirely owing to the hour's handling which he describes; and you may be sure there are few cases indeed in which the taxis should be continued, even with gentleness, for such a length of time; there is far too much risk of injuring the contents of the sac, as well as the integuments. It was true, also, that the entire absence of symptoms of strangulation was against the probability of mortification; but, though it may seem strange, the effects of a stricture are very variable in different cases, and you must not act as if violent symptoms are always to be looked for; the strangulation may go on to the destruction of the bowel, and yet there may have been no sickness or symptoms of peritonitis; the effects may be confined to the part itself, and there need not be even local tenderness to any great degree. Whenever you are concerned with a hernia it is always better even to operate unnecessarily than to incur the risk of some intestine being killed for want of it; in this case, then, with much inflammation over a hernia, with some bowel apparently down, and with fluid in or over the sac, and with a certainty that there was cellular inflammation, the proper treatment of which is usually an incision to prevent its spreading, I proposed cutting down upon the part, rather than leave it to itself, but the patient would not give his consent; I therefore gave him a dose of calomel and colocynth, and a poultice over the inflamed part: he had previously had a warm bath. The next morning the hernia was reduced by slightly pushing it upwards and outwards; he felt very comfortable; there was no vomiting, no pain in the abdomen; the inflammation had decreased, though the fluid was still felt; the pulse was 79. He slept well, and his appetite was good; and on the 8th also the note says:—No pain; inflammation lessening, though there seems to be rather more fluid about the external ring.

And now I suppose the patient congratulated himself on his refusal, and was inclined, I dare say, to think himself a much better surgeon than I was, since he was apparently getting well. When patients recover after they have refused an operation which has been proposed to them, the judgment of the surgeon is often and not unnaturally impugned, and yet the advice may have been perfectly right. It must be remembered that our opinions

are formed on a certain average result of cases, and we have no right to calculate on the chance that a case may happen to be that of a fortunate individual, who escapes the average mortality. A patient, on the other hand, having the chances fairly laid before him, may, without impropriety, if he chooses, incur a certain amount of risk above the average; and where they do refuse an operation it is surprising how many recover: the firmness of mind, or obstinacy, or whatever it is called, in particular cases, enabling them to get through diseases and dangers, to which more timid persons would fall victims.

But this amendment did not continue. On the 11th the notes say, the hernia came down yesterday, but was returned again to-day; there is some redness and fluctuating swelling over it, with hardness of the subcutaneous tissue; bowels open; no rigors; tongue clean. On the 14th, the hernia is continually coming down, obliging him to keep his hand pressed on the inguinal canal; and the skin around, with the cellular tissue, is soft, fluctuating, and cedematous, and he made this worse by trying to wear a truss over the inflamed part. On the 18th, the fluid seems to be more confined to the sac of the skin; over and around it is swollen and hard, but it is not painful. On the 22nd, increased redness and swelling and fluctuation; and, finally, on the 23rd, there is a dark blue spot over the abscess, where the skin is ulcerating. His objections to the lancet or knife continued, however, to the last, and he went out with the abscess just on the point of bursting.

It became then certain that suppuration had taken place; and he was fortunate enough to have the cellular inflammation, with which he was admitted, not spread as it would have done in many persons, but become a circumscribed abscess below the skin. What the fluid was below this is not so clear; at first it appeared so tense and limited, as necessarily to lie in the sac itself, but then as the hernia afterwards passed in and out of the inner ring, the fluid must have passed up also if it had been in the sac, whereas it only became more flaccid when the bowel was reduced and tense when it was down; so that I think it was most probably formed beneath the fascia propria and the distended abdominal tendon; but the patient has not come back to show us what has happened.

The case is curious in itself, but it probably made the more impression on you from its great resemblance, when first admitted, to another case of strangulated hernia, in which there actually was mortification, about five weeks ago; and this was a most remarkable case altogether, presenting us with what was inexplicable at the time of operation, and unique, I believe, when the examination after death explained what had been before observed. I understand that some gentlemen who saw the operation did not witness the examination, and some who were present when the case was examined

did not see the operation, and therefore I have thought that a connected account of the whole case would be interesting to you, with the several important questions to which the case gave rise.

I allude to the case of Sarah Brynning, 42 years of age, who was admitted on the 13th April, with femoral hernia, of large size, on the right side, situated immediately under Poupart's ligament, containing intestine, not very tense, but very painful: the whole abdomen tender, and very tympanitic, marking out the folds of the intestines, especially of the colon. There is continued sickness; countenance anxious; skin hot and dry; tongue white and moist; pulse very quick, 120, and very weak. The skin to a small extent was dark and livid, and thick, as if infiltrated from gangrene of the bowel. She has also an umbilical hernia, containing omentum, loose and free from pain, which she has had for twenty years.

She has had femoral hernia for the last three years, and has worn a truss for it, being able to return it entirely even within the last week: the truss, however, kept it up only imperfectly. On Saturday, the 11th, it came down in the afternoon, and she was unable to return it; the same evening she had great pain in the part and in the abdomen, with vomiting. The redness was unnoticed till she was admitted.

Our patient had an umbilical as well as a femoral hernia, and from what I have already said of the difference in the local signs in different cases, you may suppose that it may occasionally be difficult, when there are two herniæ, to know which of them is the seat of the strangulation; there could be none in her, however, nor is there often much difficulty; it is more difficult sometimes to know if the symptoms depend on the hernia, which is visible, or on some internal cause. It is, however, far better to operate on a hernia, which is not tender and painful, when there are other symptoms of strangulation, than to incur any risk of the symptoms arising from the rupture, and being left unrelieved; I have operated, and seen others operate, under such circumstances, and found that the vomiting and other abdominal symptoms depended on internal causes, and not on the rupture, but in others the local signs have been altogether wanting, and yet the operation has saved the patient's life.

You observed in the next place how very severe the symptoms of strangulation were, as indicated by the inflammatory signs, and by the great distention of the intestines; only 48 hours had elapsed since the bowel came down, and yet you saw to what an extent the gangrene had proceeded, and in less than three days and a half her death took place: on the other hand, I have operated on cases as late as the seventh day with complete success, finding very little inflammation of the bowel, though the sickness was as great as in this case. Doubtless, the difference depends on various points; partly on the tightness of the stricture, so that twelve hours may be a fatal

time, but partly also on the quantity and state of contents of the bowel above the strangulated part ; besides the general condition of the patient.

It does not appear that anything had been done for this patient before her admission, nor was anything material done before the operation. I happened, if I remember right, to call at the hospital shortly after her admission, and I gave an hour for her to become quieter after her removal, and for you to be summoned, and then proceeded to the necessary operation, which was required even if the hernia had gone up, on account of the gangrenous condition of the outer parts.

The notes tell you that an incision was made the whole length of the hernia through the integuments, when it was found that the cellular tissue was infiltrated with pus and lymph, the lower parts being glued together by inflammation. On cutting down to the sac, not being able to expose it properly, half a crucial incision was made outwards ; the exposed sac was dark coloured, and when cut into, a large quantity of dark coloured fluid, like treacle, escaped. The sac contained several turns of intestine, altogether about fifteen or sixteen inches in length, which was full of air and liquid, and continued tense, but its colour was dark ; it had lost its transparency, in fact, and had spots of gangrene in some places.

The treacle-like fluid, which appeared on opening the sac, had every appearance of having come from the interior of the bowel, though it had not the proper faecal smell ; but when this happens with gangrene of the bowel the intestine generally lies flaccid after the emptying of its contents, and a laceration becomes apparent. In this case, however, the bowel remained, as you saw, distended and tense, and no more fluid seemed to come away from pressing and handling the bowel ; so that I concluded that, although thicker and darker than usual, it must have been the secretion of the sac, and of the surface of the strangulated intestine.

I therefore divided the stricture upwards and inwards in the usual manner, and had to determine what I should do with the gangrenous intestine.

When the bowel mortifies in strangulated hernia, it is found in two different states ; in the one it is soft and flaccid, and lacerable, and no circulation is apparent in it ; it is usually of a dull brown colour, and is altogether dead, and no course is open to you but to make a free incision in it to let the contents of the upper bowel escape, and so make an artificial anus : in the other it is not quite dead, but gangrenous ; spots of actually dead texture are seen, but the rest is smooth, and the coats are visible, and retain the contents, so as to remain distended, and the green or brown spots are mixed with the rest of the serous membrane, in which blood still circulates ; and in this case it is often advisable to return the bowel into the abdomen. When so returned, there is very little tendency to recede from the aperture of the hernial ring, the strangulated part lies in contact with it,

and a passage is afforded through the canal; it is fixed by lymph to this situation, if the inflammation is healthy, so that when the mortified portions separate they escape perhaps by the wound, and there is an artificial anus for a time, the channel being easily retained because there is no acute angle between the upper and lower bowel, as when it is left in the sac. I operated, for instance, on a woman with femoral hernia, the intestines being strangulated in the omentum, and I returned the bowel, which was apparently not actually gangrenous; about the third or fourth day some yellow matter came from the wound, which was evidently faecal, and continued to escape for three or four days, when the little aperture closed, and the patient got well. If the little pieces pass away by the natural channel, it may be without our being aware of it; or else sometimes I have seen a secondary attack of inflammation about the time that the sloughs were likely to separate, which I have attributed to this cause. In either case the mortified bowel is enclosed by adhesion to the adjacent parts, whatever they may be, and none of the faecal matter escapes into the general cavity of the abdomen.

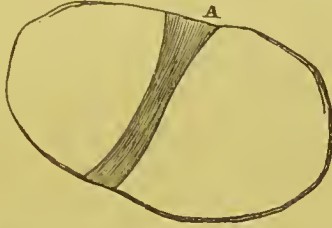
The bowel in our patient was in the latter state—not actually dead; and after the stricture was divided, it partially regained its colour by exposure and the return of circulation, and therefore, having separated some recent adhesions, I attempted to return the whole of what was down; but some difficulty was experienced in doing this, some of it going up readily, but some returning again, and part resisting the moderate force which the state of the bowel rendered prudent. On careful examination to ascertain the cause of the difficulty, I now found a small aperture in the bowel close to the neck of the sac, from which the same treacle-like fluid escaped which filled the sac when it was first opened, and which had, no doubt, escaped from this opening, though it was so small as not to allow much to come out while I had tried to reduce the bowel.

This discovery led to a change of my intentions. When a small aperture is found in a healthy bowel, or if any accidental wound is produced in the operation, it is right to take up the sides of the orifice with a pair of forceps, and tie it in a circular knot, cutting off the ends close, and then to return it into the abdomen, with the expectation of the ligature coming away by the wound or by the canal of the bowel, in the way I have before spoken of, without any extravasation into the abdomen. But here was an opening in the most changed part of the bowel; there could be no healthy lymph probably to close the opening, and I was induced to think it best to treat it as a mortified bowel, by making an artificial anus. Before doing so, however, I thought it right to examine accurately the state of the neck of the sac, lest I had before broken up the adhesions of the bowel, which would have endangered the receding of the bowel within the abdomen, with consequent extravasation of its contents; usually, when you find gangrene, there is no

fear of this, because sufficient adhesion almost always takes place to fix the bowel in the ring, where it remains alive ; but if there is any doubt, you will take the additional precaution of fastening the bowel in the wound.

On more minute examination of the inner part of the neck of the sac, it was next found that *two portions* of bowel were protruded, which were separated from each other by a band of whitish-yellow substance passing obliquely from above downwards and outwards, but nearly perpendicularly, as in the diagram (fig. 1) ; so that the femoral ring was divided into two

FIG. 1.



A. Appearance of femoral ring in the operation.

openings, out of each of which a fold of intestine escaped ; the inner and under one being rather the smallest and least gangrenous, and the upper and outer larger and more gangrenous. The nature of the intervening substance, as it joined the upper and lower margins of the ring, was not evident.

Here there was a new state of things, introducing fresh considerations of importance ; and I may observe, that in performing the operation, all the preceding questions, and what I have now to discuss, had to pass through my mind, and the result to be decided at once. If it was right at first to endeavour to return the bowel, and this again appeared improper, when an opening in the gangrenous part was discovered, what was now the right course of proceeding ? Here were two separate portions of bowel, both strangulated and in part mortified. I could not tell how near they were to one another ; one might be near the stomach, the other near the cæcum ; at all events, one was above the other. If I opened only one, it might happen to be the lowest of the two ; if so, the other not having any external orifice, might not allow the fæces to pass onwards after reduction, so as to relieve the distension above the stricture, and the symptoms would then continue. If I opened the right one as to this point, or if I opened both to insure it, one might be so near the upper part of the alimentary canal that there would be no surface for absorption of chyle, and the patient would in effect be starved, and there would, at all events, be two artificial anuses ; and one is bad enough. First, however, I had to consider what was the cause of this double opening ; were there two separate herniæ in contact by passing through the same ring, as in some instances which have been observed ? It seemed not very likely that this was the case, as there was clearly one peritoneal sac, in which the strangulated folds of the intestine

were included. Of what nature was the division, then? I endeavoured, by the director and by the finger passed into the abdomen, to get round the separation and push it out, so as to see if it was safe to divide it and lay the two openings into one, as they had probably been formerly; but I could not do this, from some resistance of soft substances in the abdominal cavity. Finally, then, I determined on this plan: I determined to take the chance of one fold recovering itself altogether, or lying at the wound for its contents to escape, if it ultimately died; and accordingly the inner and least altered portion of bowel was returned into the abdomen, and the outer and worst fold, with the ulceration or rupture in it, was freely opened, which contained a large quantity of the same dark-coloured offensive fluid as had been found in the sac. The edges of the intestine and of the incision were fastened together by ligatures; two small arteries were tied on the upper flap, and a poultice was applied to the wound, with a chamomile poultice to the whole abdomen. She had also three grains of calomel and a grain of opium, to quiet the stomach, and some beef-tea and milk were ordered.

She was at first a little relieved by the operation, so that the notes on the next morning (the 14th) say, she feels sick, but has not vomited; but this was all the benefit, for it is also said, the abdomen is much swollen and tense, but not very painful. No feces have passed either by the natural or artificial anus, and only a small quantity of dark brown offensive feculent matter. Tongue white, and dry; feels thirsty; pulse weak; and at half-past one the notes say, she seems to be sinking. The pulse is weaker; tongue dry; great thirst. Abdomen still much swollen, and tympanitic. On dilating the aperture of the bowel with the finger, a large quantity of dark foetid fluid escaped from the opening in the bowel, which appears quite free, as the finger can be passed into it readily. She has only been sick once, after taking some beef-tea. By half-past six it is noted that she had vomited three times since four o'clock. The abdomen is still swollen and tympanitic, and a small quantity of dark brown fluid is constantly escaping from the wound. She does not complain of pain in the abdomen. Pulse weak, hardly perceptible; skin cold, covered with a cold clammy sweat, and seems to be rapidly sinking; and she died soon after one in the morning of the 15th, not quite three days and a half from the coming down of the rupture.

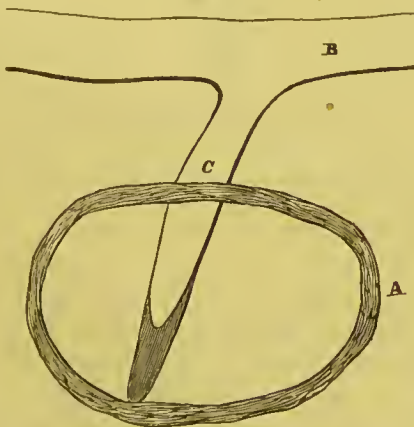
The post-mortem examination revealed the real state of things, an account of which I will read to you:—

“Body well-formed, but rather spare. Abdomen tympanitic. In the right groin there was an incision, occupying the situation usually selected for femoral hernia. The skin and cellular tissue of this region were of a dark livid colour, the latter being infiltrated also with serum and lymph of an unhealthy appearance. The hernial sac was also of a dark colour, and

contained two knuckles of intestine (that which I had reduced, having come out of the opening again because quite mortified), separated from each other by a strong band, of a yellowish colour, placed obliquely across the peritoneal opening of the sac. Both knuckles were in a state of mortification, and one of them, situated above and little to the outside of the other, had been laid extensively open, and fixed at the two extremities of the incision by two ligatures passing through the skin and cellular tissue. On examining the parts in the cavity of the abdomen several convolutions of small intestine, of a very dark colour were found united to each other, to the circumference of the femoral ring, and to the parts in the immediate neighbourhood, by the adhesions, which were, however, easily destroyed by the finger.

“After carefully unravelling all these convolutions it was discovered that the yellowish band above described as dividing the hernial sac, at its peritoneal extremity, into two parts, was itself formed by a portion of the small intestine, about a foot from the cæcum, and covered with lymph, which had become united by very firm adhesions to the two opposite points of the mouth of the hernial sac, which was very large. The portion of gut thus fixed was placed nearly horizontally across the sac, running in a somewhat oblique direction from without inwards (in the operation, however, its position was, as I have before told you, nearer to the perpendicular than to the horizontal direction). On opening the intestine, this part of the gut was found to form a species of diverticulum, deviating somewhat from the course of the intestinal canal in its immediate neighbourhood. This deviation was most probably produced by the attached parts of gut involving only a portion of the diameter of the tube, the other portions being drawn upwards at some former period. You will, perhaps, understand this description from the diagram which I have made (fig. 2), and you will perceive that if I

FIG. 2.

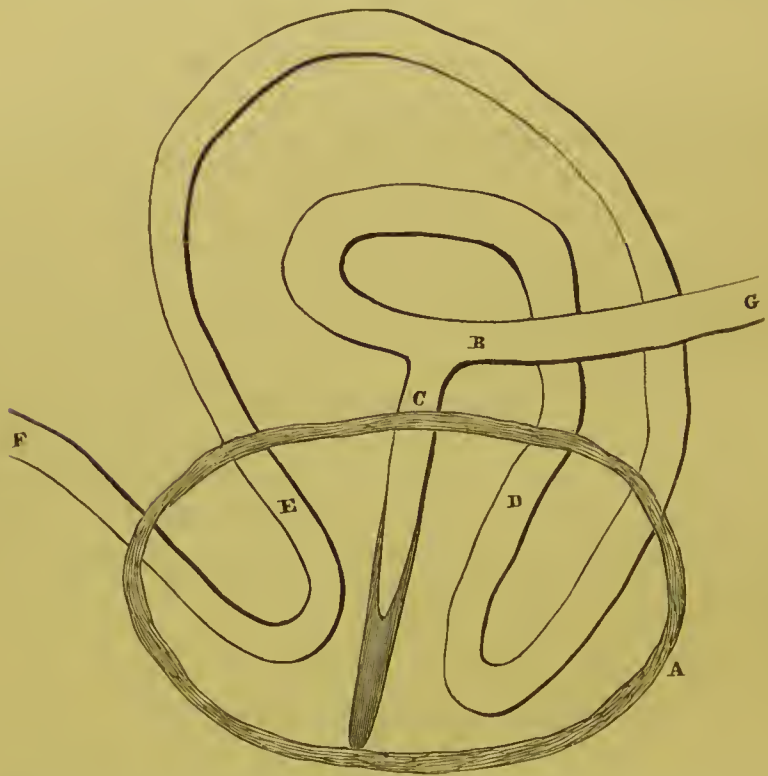


A. Femoral ring. B. Small intestine within the abdomen. C. Diverticulum passing to the inner surface of the femoral ring, and firmly united to its upper and lower margins, so as to divide it into two openings.

had divided the band, the nature of which I could not ascertain in the operation, I should, in fact have cut across this portion of bowel, where it formed the partition.

"The knuckle of intestine which had slipped *under* the band thus produced, was situated about three inches above that portion which had formed the band itself; it was, besides, twisted upon itself, thus adding to the difficulty already existing in the passage of the fæces. The knuckle of intestine which was *above* the band, and which had been laid open by Mr. Hawkins at the time of the operation, belonged to a convolution of intestine situated nine inches above that portion of the intestine which was below the band (fig. 3).

FIG. 3.



A. Femoral ring. B. Small intestine. C. Diverticulum. D. Fold of intestine turned upon itself and strangulated on the inner and lower side of the diverticulum, returned in the operation. E. Fold of intestine strangulated on the outer and upper side of the diverticulum, opened in the operation. F. Upper end of the small intestine. G. Lower end of the small intestine.

"Both these knuckles were in a complete state of mortification, but the line of demarcation was not well defined. The small intestines above the strangulated portions were distended with fæces and flatus. All the intestines were much injected, and their convolutions were adherent to each other. There was also a small quantity of bloody fluid in the cavity of the peritoneum. The omentum was puckered up into a thick band passing down over the intestines, and fixed to the parts in the neighbourhood of the

right femoral ring; it was of a dark colour, and much inflamed. In the umbilical region was an old hernial sac. The other viscera in this cavity presented nothing remarkable."

Such, then, is a description of this very curious and interesting case, to which none published I believe bears any resemblance. I do not know, however, that I could have proceeded very differently, in any respect, if I had known the state of the parts. You will observe that the knuckle which I had selected to open, as the uppermost and most mortified, and as having the opening in it, proved to be, as I hoped, the nearest to the stomach, so that making a second artificial anus, by opening the other knuckle, would have been of no use whatever.

Neither does our time to-day allow me to enter into the subject of the necessary treatment in cases of mortification of the bowel, after the operation has been performed. The upper bowel being allowed to empty itself through the artificial anus, it is very possible for the patient to recover, and for the opening to close; the fecal matter at first escapes entirely from the wound, but in time finds its way into the bowel below, either directly, by the acute angle at which the upper and lower extremities lie, becoming less from their retraction, or indirectly, through the intervention of the sac, or a more direct opening may be established by operation. You may see by a preparation which I took from a patient of mine, the state in which the ends of the bowel are at first left after the separation of the mortified bowel; it was in a woman who was beginning to recover from the effects of the strangulation, as the passage through the artificial anus was quite free, when on the fifth day, the wound being quite clean, she was attacked with what seemed a return of peritonitis; but the pains were uterine pains, she miscarried, and died in five days more from the irritation—the uterus being sloughy, and the ovarium on one side having some pus in and around it.

How much patients will sometimes bear, and what efforts nature will make to rally, was well seen in an old man, above 70, on whom I operated about two years ago, on the twelfth day, probably, from an imperfect account given of it by the patient, certainly as long as the tenth after the strangulation, in whom the gangrene of a femoral hernia had gone much further than in our present patient, and yet for five days he tried hard to recover his strength, and had he been younger, would doubtless have recovered. I remember this man taking (and digesting it all perfectly) not less than six mutton-chops daily, with beef-tea and other things, together with four pints of porter, 24 ounces of wine, and 16 ounces of brandy; and of course the principle of treatment in the gangrene of this part, as of most others, must be the same as this; not, indeed, always to this extent, but the patient must be well supported under the depressing influence of the disease.

[*Medical Gazette*, vol. iii., new series, p. 45.]

CASE OF LARGE HERNIA OF COLON, CÆCUM, APPENDIX, AND ILIUM.

IN the short time that remains, I will draw your attention to some points in a case of hernia, on which I operated a few days ago, which is, in several particulars, very interesting.

Thomas Jackson, æt. 36, was admitted May 10th, at 1 in the afternoon, with an incarcerated serotal hernia of the right side. He has had a rupture since he was six years old, and has always been able to reduce it himself whenever it came down. He has always worn a truss, which he left off a short time ago, as it was broken. The hernia came down yesterday evening, and he was not able to reduce it. The tumour is of considerable size, containing, by its sound, air and fluid; the external ring is lax, but the stricture is apparently very tight at the internal one. No symptoms, except a slight disposition to sickness, without any vomiting, and some slight tenderness about the inguinal canal. I tried, for a short time, to reduce the hernia in the out-patients' room, and then ordered him to be placed in a warm bath, and he was kept in for above half-an-hour; at 3 he was taken out of the bath, and I again tried the taxis without success, and the tumour was only a little less tense. Ice was then applied till near 6 P.M., when he complained of somewhat more pain from the ice, and the tumour was just as large and tense as before. A large injection was then given, and drawn off by a syringe, but without any effect upon the tumour. The pulse was 80, and no fresh symptoms had come on. At 9 P.M. I again saw him; and finding quite as much hardness in the inguinal canal, and a little more pain, I then performed the operation. Our notes continue:—It was thought at first, by opening the external abdominal ring, that the tumour might be returned, sac and all; but this idea was abandoned, and the sac was opened, which contained only a little fluid, and then it was found that the tumour was composed of the cæcum, part of the colon, and the end of the ilium, with a large appendix vermiformis, which were all much distended with air. The stricture at the internal ring was freely divided, but nevertheless the bowel could not return till after manipulation for a considerable time, when the air having been at last pushed out of the intestine, the hernia went up. The intestine was quite healthy, and only slightly vascular. Two sutures were put in, and the parts lightly dressed. The patient lost no blood. At 10 o'clock, the notes add, he was relieved by the operation, and does not complain of pain, except a little in the bowels—near the wound, in fact. Pulse soft, 68, with some intermission, and the tongue was rather tremulous.

Now in considering this case, the first point which may have struck you is the small extent of symptoms, which justified me, as I imagine, in operating:

the intestine was scarcely strangulated. It might have been said by some that it was in a state of incarceration verging on strangulation; there was no sickness, no tenderness of abdomen, no alteration of pulse, no pain or tenderness of the whole tumour; there was none of the severity of symptoms such as would have been looked for when I was a student; still less was there redness and inflammation of the skin; and I actually remember a few years ago a report being published from the practice of a surgeon of repute, of a case as somewhat remarkable, because the operation was performed before there was any external sign of inflammation! I operated because in the absence of such further signs of strangulation the hernia contained intestine, and the inguinal canal was of considerable length, and very firm and hard, and the tenderness and pain of this part, slight as they were, compared with many cases, were on the increase. With so firm a compression in the canal, not allowing any impulse on coughing to pass through, though the diameter of the neck of the tumour was considerable, you may generally be certain that you will not reduce it, and I strongly recommend you to operate before severe symptoms come on, as the safest plan for your patient, rather than wait till inflammation of the intestine has already commenced, which was always done a few years ago.

A second point to be noticed in this case is my abandoning my original intention of dividing the parts external to the sac without opening the peritoneum. My reason was this: there is one disadvantage attending this procedure in inguinal hernia which I am sure has not been sufficiently dwelt upon: if you divide the tendon of the external abdominal muscle, and the lower borders of the two internal muscles, and the fasciæ, sufficiently to allow of the sac swelling out so as to show you that the pressure which causes the stricture has been removed, you take away a great deal of the protection given to the abdomen after the common operation by these parts; the patient is sure to have a large hernia afterwards, and requires a large truss, which can still only with difficulty prevent the protrusion. If, on the other hand, the sac is opened lower down, the internal ring and neck of the sac can be divided as freely as you wish, while enough is left to cover the canal afterwards, and enable a common truss to keep up the hernia. On exposing the external ring in this case I found that the tendon and other parts were much spread out, giving great length to the canal, and I did not therefore proceed in this way, but opened the sac below the external ring in the common way. I believe, indeed, that I should certainly have failed in reducing the hernia, if I had gone on as I first intended, even with a very large incision: I have tried it, and seen it done by others several times in old inguinal herniæ, without success, although the parts have been so fully divided that the neck of the sac has quite bulged out on the pressure being removed; and yet the stricture remained, because it was formed by internal

projection of the neck of the sac; besides which, there is the chance of the stricture being actually situated in the omentum within the sac; of which we have had three instances, I think, in the last twelve months. I say nothing at present of femoral hernia, and recent protrusions at any opening, but I think in old inguinal hernia the operation of opening the sac below the external ring is generally the best.

This case was in the third place remarkable from the nature of the contents, which consisted of the colon, cæcum, and adjacent ilium, with several inches of an appendix as large as a small intestine. There have been several instances in the hospital lately, of strangulation where the colon has been found in the sac, and I have repeatedly had to operate in such cases. In all of these the reduction is very difficult, although the opening is large, and in many persons cannot be effected at all. The colon coming down brings with it its cellular connection to the parts behind; it slides down as it were, and is as much connected with the scrotum as it is in the loins to the parts there situated; the operation is therefore difficult, and great care is necessary not to open the bowel, which has half or two-thirds of its circumference without any sac at all. I have found only a little portion of sac on the upper and inner part of the tumours (where you must always try to open it), and the great bulk of the protruding part is attached to the vessels and cellular tissue, so that you cannot reduce it, and must leave it in its place, having divided the stricture, in hopes that it may go up by degrees in the same way as it descended. This was not, however, the cause of difficulty which I experienced in the reduction in this case, for the great intestine was protruded without any attachment; but what was remarkable, the great length of colon here found with the cæcum was as loose and free within the sac as small intestine commonly is. Whenever the cæcum is protruded there is a greater proportion of solid matter than there commonly is with small intestine; the valve of the colon and appendix veriformis are very thick, and from the connection which the ascending colon has within the abdomen, it is impossible to push up the great bowel first, but you must begin with the ilium and the valve, and make the cæcum and colon revolve, as it were, towards the centre of the cavity, as they cannot be pushed up straight into the abdomen. This was one cause of difficulty in this case, and another arose from the quantity of air contained in the cæcum, which drew down again what I got up. I could not, of course, squeeze up the air through the valve, and something or other prevented its passing upwards in the colon for a long while; when I did finally press the air upwards, the reduction was easily effected; with small intestine you can easily push up the air in both directions.

In the next place, as to the after treatment, there were here two dangers of opposite character to be guarded against, and what did good for one of these

would make the risk of the other greater. In all cases of strangulated hernia you have necessarily to look carefully for the signs of inflammation of the peritoneum produced by the stricture of the protruding part; but besides this it was evident from the tremulousness of the man's tongue, and intermission of his pulse, and from his acknowledgment when he was questioned in consequence of our observation on these signs, that this patient, a groom in Tattersall's yard, close to us, had led an intemperate life, and was just a fit subject for delirium tremens. We were therefore on our guard, and prepared to treat the earliest appearances of it; but the inflammation was the first danger, and fortunately for the patient no more depletion was necessary than that arising from some leeches to the part of the abdomen which became painful the day after the operation. I also gave him a grain and a half of opium, and three grains of calomel, directly after the operation, and smaller doses were given him twice in the next twenty-four hours to obviate the inflammation present. You saw, however, that abstinence from his usual potations produced the effect we anticipated, and forty-eight hours after the operation he became furiously delirious; the attack coming on rather suddenly. Repeated doses of laudanum during the night had the effect, however, of quieting him, and setting him to sleep, and as the bowels were not then so open as on the previous day, I directed a turpentine injection to be administered. At my visit yesterday, the 13th, you saw that the opium taken in the night had so completely subdued him that the narcotism was even more than desirable, for he did not breathe more than eight times in a minute; it was striking, while he was in this state, to observe how thoroughly a few drops of water sprinkled on his face roused him to perfect consciousness, although I shook him in vain, even with some degree of roughness. To-day (the 14th), you see that he is going on quite well, free both from delirium and inflammation. Had it not been for the importance of the part affected, had it been the arm or leg for instance, I should have given him more stimulants and less narcotics; I did, however, order him some beef-tea yesterday, and have directed a mutton chop to be given to-day.

The last circumstance I will allude to in the treatment of this case is the inflammation of the sac, which is not uncommon after the operation, particularly in those who have been accustomed to drinking, like our patient. When on the second or third day you find your patient become restless and irritable, and feverish, and his pulse varies in frequency, but yet is probably not so sharp and incompressible as in peritonitis (indeed it is sometimes soft in the circumstances I am going to allude to), and if the patient is sick, and the abdomen is flatulent, and above all, if he has shivering or distinct rigor, and there is a disposition to perspire after he has been hot and flushed, you are not to conclude at once that he has inflammation of the abdomen, but

examine the wound carefully, and perhaps you will see some redness of the edges, or if they have united perfectly, and are not red, yet you can feel a puffiness, and the patient has a good deal of tenderness: put a probe then between the lips of the incision, and a drop of dark pus will escape, if it has not already shown itself. In these instances you must immediately separate a part or the whole of the adhesions to let out the pus, and prevent the extension of cellular inflammation, which may otherwise go on to a great extent round the hip or down the thigh, or it may spread up below the muscles in contact with the peritoneum, which membrane thus becomes secondarily affected, though it may have escaped the effects of the strangulation. You saw then that I separated the whole of the adhesions on the second day (the 12th), before the delirium began, and the consequence of this was that the redness immediately ceased, and the wound, which was foul and sloughy, is already cleaning to-day (the 14th), and the man is going on well.

[There was in this case some return of pain in the abdomen on the day after the lecture was given, but it was immediately relieved by a few more leeches, and the patient is fast recovering (May 21st), with a diet of meat and porter.]

[*Medical Gazette*, vol. xxxiv., p. 246, May 24, 1844.]

CLINICAL LECTURE

ON

SOME DISEASES OF THE RECTUM.

May 25th, 1847.

GENTLEMEN,—Among many subjects worthy of your attention, are the ulcerations and diseases which take place at the lower end of the bowels: a good number of these cases have lately come under my care, which I have grouped together, forming a series of cases, which I intend to bring before your notice. First, then, you may meet with some cases in which there are tumours and excrescences about the anus, but no disease within the bowels; secondly, there are others in which disease exists in the bowel, but there is no external disease; whilst, thirdly, you may have some cases in which there is disease both within the bowel and external to it. The first case that I shall bring before you illustrates the first class of these diseases. Mary Anne Patten, æt. 25, servant, was admitted May 5. The notes say—There are a few warts, covered by true skin, situated near the anus on each side, not of very large size; there is no discharge from them; she has no other complaint, and they have existed five months. Was ordered a rhubarb draught, and the lead lotion was applied. On the 9th some of the warts

were tied, and some others excised. On the 15th the remainder were removed, and she went out cured two days afterwards. When you have cases such as these, in which no specific origin can be traced, in which they are nothing but simple warts, the peduncles being accessible, they are easily removed by the scissors and ligature, as in this case, or by various local applications, and you see in this case that in a fortnight the disease was cured.

But in the next place you have cases in which the disease is situated all around the margin of the anus, sometimes independent of internal disease, but arising from some specific cause ; and sometimes with internal disease also, as in the following case of Jane Gilmore, æt. 22, admitted March 10th, in the Burton Ward. She has condylomata at the margin of the anus, which are very painful, and from which there is a good deal of discharge ; they have existed for seven or eight months, and they came eleven months after she had had primary syphilis ; she has pains in her legs ; there is a small ulcer on the inside of her cheek, and another on the tip of her tongue. The condylomata are very large, and partly external, and partly within the sphincter. There is a good deal of constriction of the rectum just within the sphincter, as was ascertained by passing the finger. The exact origin of the disease seemed somewhat doubtful, but it is more probable from the history that they commenced externally, and proceeded back into the gut. These structures are probably a modification of diseased skin, which may arise from various causes, most frequently from the natural secretion becoming morbid, as in gonorrhœa and syphilis, in which complaints, warts and condylomata are very frequent ; the secretions not improbably passing from the vagina, running down between the clefts of the nates and anus, irritating the skin, and thus giving rise to those diseased structures which in the former case were simple warts, but in this were probably produced by the poison of syphilis. On the 5th of April the condylomata were removed with curved scissors ; they were about one inch in breadth and length, and situated all around the anus. She was put under the influence of ether, which was successful in relieving the pain ; there was some hæmorrhage, which soon ceased. She left the hospital a month afterwards, the whole of the surface having healed, but was not perfectly level with the surrounding skin. In this case care was taken not to remove more of the surrounding skin than was necessary, on account of the greater degree of contraction which would take place around the anus, some having existed prior to their removal ; a kind of troublesome stricture being caused just within the sphincter by this contraction.

The next case is the exact reverse of this ; it is that of Elizabeth Mount, æt. 24, admitted the 5th of May. There is slight stricture of the rectum, with occasional purulent discharge from the bowel ; there is a crop of condylomata at the margin of the anus, probably produced by the discharge, and the

skin around looks very inflamed ; there is an abscess (apparently) situated very near the anus, in which fluctuation can be felt very plainly ; one labium is very much swollen, but there is no discharge from the vagina ; had rigors three weeks before, but has not had any return since ; sweats a good deal occasionally ; has a good deal of pain in the hypogastrium, and cannot pass the motions without great pain ; the fæces are always scybalous ; the condylomata have existed for ten months. Here then, the condylomata do not seem to depend, as in the last case, upon any external disease proceeding inwards, but upon disease existing within the bowel, the discharge inflaming the skin around, and causing great thickening between the anus and bowel. It is very important in all these cases to examine the interior of the bowel, and it is a frequent occurrence to find disease within, first pointed out by the inflammation and ulceration and formation of excrescences that is going on externally. On some occasions the bowel has not been examined, when, if it had been so, the disease would have been discovered, and would have saved the patient endless trouble and distress. In one case a woman came under my care, whose sister had died of diseased rectum, and who was naturally alarmed by some excrescences formed in herself around the anus, and by a degree of constipation which only allowed her to pass evacuations from the bowels once a month, when the menstrual excitement produced some action of the rectum. Her surgeon had cut off some excrescences, of course without relief, because on examining the bowel, which he had not done, I found a very bad stricture, which I dilated by bougies, and which she kept open for many years by passing them for herself. In this case of Mount, the abscess burst, but she went out of her own accord before she was properly cured, nothing having been done for the condylomata.

The ulceration which takes place internally independent of external disease, is shown in another case.—John Malony, æt. 60, admitted under Dr. Nairne, 7th of April, with rheumatic gout ; was transferred to me on the 26th, for an ulcer of the leg and discharge from the rectum, which he has had for the last eight months ; it came on after cholera. The disease, which was situated here in the interior of the bowel, caused ulceration, which was very considerable : the man was likewise in a bad state of health : an injection was used, made of the decoction of starch with twenty minims of the balsam of copaiiba ; something similar to our green dressing of the hospital for external ulcers : a morphia draught was also given : under this treatment the discharge ceased. He has not been examined very lately ; the ulceration probably, however, has not quite ceased. You may do a good deal by this internal treatment, sometimes also by a few drops, thrice daily taken by the mouth, with liquor potassæ, and by remedies which act more particularly on the lower end of the bowel, as, when the ulceration is quiet, the confection of black pepper : this was ordered for the last patient,

and frequently heals up small ulcerations. You may give it in doses of ℥ij. to ʒj. o. n. for three or four weeks together. Some ulcerations are more troublesome and last longer, and then these means are not always sufficient, even though the strictest attention may be paid to the general health of the patient. In some cases small doses of the liquor arsenicalis, three to five drops three times a day, given with some other tonic, may be beneficial. Perhaps arsenic is especially useful, like the pepper, by its local effect, for it affects the rectum as well as the stomach in whatever way it is given. *e. g.* if a solution of arsenic is injected into the veins it irritates both these parts; if, however, it is given with bark or some other tonic, it is at times very beneficial in some cases of ulceration of the rectum. You must also apply local applications by means of the speculum, caustic in substance, the red wash, or by introducing a bougie covered with linen on which some mercurial ointment is smeared. If under this treatment the ulcer still remains troublesome and gives rise to great straining and irritation, you must resort to entire division of the sphincter, so as to relieve those symptoms by preventing all irritation arising from lodgment of feces about the ulcers, and from the action of the muscles of the part. This treatment is, however, seldom necessary; but in obstinate cases it may be resorted to. I mean in obstinate cases confined to this part of the bowel; of course it can be of no use where the disease is more extensive. Here, for instance, is a portion of the intestine of a patient [exhibiting a preparation] who was admitted under Dr. Wilson in January, 1845, where there was great diarrhoea from the extensive ulceration that was going on. He suffered for a long time, his bowels were always acting, and the great trouble he caused not only to himself but his friends and the nurses of the hospital, preyed so much on his mind, that a few days after his admission he cut his throat, causing a fatal wound of which he died in two days. The wound inflamed and suppurated, and after death there was found an extensive purulent effusion in the mediastinum behind the sternum, inflammation of both lungs, with hepatization, the result of recent inflammation. In the post-mortem examination of this case the small intestines presented nothing remarkable, but the whole of the large intestine, from the caecum to the anus, was extensively ulcerated, and of a dark purple colour in patches. In the caecum the disease existed in a few separate ulcerations, surrounded by large portions of mucous membrane, but still proceeding down to the muscular fibres, which in some places even here were laid bare. In the transverse colon and remaining part of the intestine the ulcerative process had nearly destroyed the whole of the mucous membrane, leaving as it were only small islands of it. The membrane was softer and more pulpy than natural; the circular fibres of the intestine were extensively laid bare, and its coats were in many places so thin that they gave way on being removed for examination. I need hardly say that when so extensive

a disease as this takes place, the patient's recovery is hopeless, not only from the considerable discharge, but from the hæmorrhage which takes place; emaciation and hectic come on, and the patient generally sinks under it.

But we now arrive at another part of our subject: if the ulcerations are small, they may heal up; if large, however, they are, as we have seen, generally fatal. Now when an ulcer heals up, the cicatrix which remains, being smaller than the original wound, contraction is the result; if, then, a circular tube similar to the rectum, ulcerates, the cicatrization taking place causes contraction of the tube, and thus a stricture or narrowing of it is produced; sometimes the ulceration only partially heals, and you have a stricture, but chronic inflammation and ulceration go on, the stricture yielding from time to time during the time the ulceration is considerable, and contracting again, as it heals, till at last a greater contraction takes place, the passage of feces is totally prevented. Here is a preparation from a patient who died of phthisis, in which a portion of small intestine which had been ulcerated became healed, and contracted for nearly an inch to the size of a quill or little more. Here is another portion from the same patient, in which the contraction is still greater, producing stricture of the sigmoid flexure of the colon, and several others existed in this patient, all arising from simple ulceration and not from malignant disease. Thus, then, may fatal contraction be the result of simple ulceration of the bowel at any part, but it is chiefly in the rectum that you meet with it; it is the most frequent by far of the cases which are called stricture of the bowel: real hardening and growth of the coats of the bowel is in fact very rare, more so even than malignant disease of the rectum; scirrhus of the rectum does not unfrequently take place, however, and possibly exists in the next case I shall bring before you, that of Geo. Jackson, æt. 36, groom, admitted May 5th, with several large pendulous condylomata, some an inch long, situated near the edges of the anus, and there is a good deal of hardening and constriction of the skin between the excrescences and the anus, as well as of the rectum itself, from ulceration, extending as far as the finger can reach, giving something of the feeling of scirrhus. Bowels never act without medicine or an injection, which he is frequently in the habit of using; his motions are never larger than a tape, and he has pain in passing them; matter, occasionally mixed with blood, passes at the same time. Has lost flesh lately. Has had constant hacking cough, with yellow expectoration, for the last two years, but it has become more violent during the last six weeks: the disease of the rectum is of three years' standing. He has had a good deal of riding, and attributes much harm to a long ride, quickly performed, to Rome. These drawings and preparations show us the ulcerations of the intestines occurring in patients affected with phthisis, and others in which there is dysentery and piles, independent of any affection of

the chest. In this case of Jackson the disease is very bad ; it is almost impossible to pass the finger through the contraction, preventing almost the passage of the *feces*, and showing how dangerous must be the consequence if any solid body is retained, which is swallowed and not digested, and being unable to mould itself to a proper form, may by its stoppage, totally prevent the passage of the *feces*, and hence cause death. On the 7th, some opium and colocynth were administered. On the 21st, six days afterwards, the notes say—health improving ; motions slimy, but containing no pus mixed with them ; a bougie, covered with lint and dipped with the solution of the nitrate of silver, to be passed every other day. In some cases much good can be done by passing bougies ; it requires, however, great care, and you must proceed cautiously every other day or every third day, in some cases just passing it only and then removing it ; in others it may remain for half an hour, or one or two hours. If you proceed carefully in this way the parts become relaxed in time, and the patient's life may be considerably prolonged by it. A woman, Jane Andersen, *æt.* 27, married, was admitted April 7th, Princess's Ward, with stricture of the rectum and discharge of a purulent character ; the end of the finger cannot be passed through the stricture, which arises from contraction following ulceration. She was confined seven years ago and had piles afterwards, which were tied ; she has had stricture and discharge from the rectum ever since : the disease was nearly cured till five weeks ago, when she caught cold, and since then the symptoms have returned : there are no piles at present. In this case, no doubt, the piles were the result of pregnancy—a frequent occurrence. The bougie in this case was used, and was productive of much benefit. On the 22nd, the notes say—the bougie was again passed, to be left in for an hour ; improving. On the 24th was much better, and she went out much relieved on the 28th. You have also seen another case somewhat similar to this and relieved in the same manner, which occurred in a patient of much greater age. She was 58, and was admitted the 12th of last month. There was stricture of the rectum about two inches from the anus ; cannot pass her motions without great pain, nor unless she takes medicine ; they are not larger than a quill ; she has frequently a purulent discharge from the bowel. She has had stricture for twelve months, and was in the hospital about six months ago under Mr. Keate, when bougies were passed, which gave great relief ; she has had many children, but not for many years ; cannot assign any reason for the disease. There is a fistulous opening on the posterior part of the crest of the ilium which leads to the *dorsum ilii* : on the finger being introduced into the anus there was found to be a stricture scarcely admitting the point of the finger, with much ulceration and contraction of the bowel : bougie to be used. On the 19th a large rectum bougie was passed and retained for two hours. On the 21st she went out of her own accord.

The great difficulty in these cases is to make patients attend to themselves after their discharge from the hospital, the stricture in all cases being so likely, if neglected, to return; they should use a bougie themselves, which will prevent any obstruction, and they may preserve their lives for years. In the next place the ulceration may not be confined to the mucous membrane of the bowel only, but may communicate with the parts around. In the urethra, as you know, it is common for an abscess to take place external to the canal, the ulceration passing through all the structures of the urethra; so also with ulcerations within the bowel, it may go through all the coats, and give rise to inflammation and abscess in the surrounding cellular membrane; or sometimes there is a long narrow fistula communicating with the bowel by only a very small opening; or sometimes fistulæ form in various directions, communicating with the bowel or with each other in a tortuous manner, and opening even at some distance from the anus, as you may see in this preparation. In any case in which you may be consulted for fistula, make an examination of the bowel, and if you find considerable ulceration, and the fistula is connected with it, whether there is stricture or only such extensive ulceration without contraction, it is better not to operate, as the incisions will seldom heal, and the operation is not without danger. If the fistulæ are quietly discharging, they give little trouble, and it is better to leave them to themselves; try to relieve the stricture or the ulceration first, and then, if the patient's health becomes restored, you may operate, and sometimes with success. If there are fistulæ connected with extensive disease you may however be obliged in some cases to do something to prevent confinement of pus. In cases of such extensive sinuses connected with the cellular tissues as these drawings show you, and collections of pus are forming, you are obliged to open them, or else the abscesses may extend further into the pelvis. The pus of these abscesses is not of a healthy character, and unless evacuated foul ulceration takes place; this spreads, goes up the sides of the bowel, and peritonitis is a frequent consequence from extension of the ulceration, sometimes even within the peritoneal cavity; secondary abscesses also often frequently take place: but the same reasons operate to prevent your meddling with them unnecessarily, for you may frequently see patients die in three or four days after, from cellular inflammation and peritonitis, or ten or twenty days after the operations, from absorption of pus and secondary abscesses.

Here is another case, in which the disease has been of fifteen years' standing, the patient having been recently admitted, but having also been under my care a year ago. "Katherine Keleher, admitted March 22nd, with stricture of the rectum, of fifteen years' standing. There is one stricture an inch and a half from the anus, and another about an inch higher up, according to her statement, both following ulceration." I do not think,

however, that there is more than one circular contraction. "Bowels have not acted for eleven days; great discharge of matter from the anus, as much as half-a-pint in the course of the day, causing great pain. Was in the hospital four years ago under Mr. Keate, and then obtained a good deal of relief by a bougie being frequently passed. She again came under me in the summer of 1846, and went out in a bad state of health, the stricture having been divided previously. She became much better in her general health after leaving the hospital, and continued so until two months ago, when she could pass nothing by stool, except after taking great quantities of drastic purgatives, and then suffered great pain in passing her evacuations, which were never larger than a quill. She has had rigors and sweats for the same period. She attributes the disease to neglect during labour fifteen years ago; but she had, previous to that period, suffered from habitual constipation, which she had neglected."

The disease in this case may arise, then, from habitual constipation, or the labour she attributes it to, and to which many women attribute the first occurrence of the disease; and pregnancy is not unlikely to be the origin, from the obstruction to the passage of the fæces, caused by the distended uterus. The rigors and sweats were signs of pus forming, and from the large quantity which she passes, there must be a large suppurating surface. But we find, in addition, on the 3rd of May, five weeks after her admission, she said she felt something give way, she having had previously sweats and great pain in the back, and about a quarter of a pint of pus was suddenly passed by the bowel,—an abscess, in fact, connected with the bowel, having burst, which is liable at any time to be blocked up, and, consequently, to produce most dangerous symptoms. It is not improbable that it was situated at the left side of the pelvis, connected with the disease which existed two years ago, and with what was then done for her. In some cases, where the stricture is very much contracted, it may be divided with advantage by the introduction of a probe-pointed bistoury, the bougie being by this means allowed to pass more easily. I did this in Kelcher when she was last in the hospital; but the incision was followed by inflammation and suppuration in the cellular tissue, and an abscess formed, which showed itself on the left side of the abdomen, in the iliac fossa. She was of course very ill, but I was absent at the time, so that I did not myself see it, but I understand she was relieved by its bursting into the rectum. I subsequently employed bougies, and she left the hospital, as we have seen, much relieved till two months ago, when the same or another abscess formed.

The abscess formed in this case was liable to very dangerous consequences if it had not discharged itself by opening into the rectum; but there is always great risk from the ulceration and destruction of parts in the sinuses which form about the rectum, which ultimately give rise to fatal inflammation

of the peritoneum. A case came under my care last year which showed one danger attending such sinuses — namely, actual perforation of the peritoneum. A patient, 34 years of age, admitted the 11th of March, 1846, with pendulous tumours and ulcer of the rectum, having, in addition, piles, which bleed; has great difficulty in passing her motions, and bearing-down pains in the region of the uterus. There is a stricture of the rectum about two inches from the orifice, with much thickening of the parts around, the effect of which can be felt from the vagina; the mucous membrane of the anus is in an ulcerated state.

20th.—Has complained of continual bearing-down pains, followed by shiverings.

23rd.—Increased pain.

26th.—Much pain in the bowels, with rigors.

30th.—Pains not so continual, but at times very severe; bowels confined for the last five days; discharge profuse.

April 3rd.—Had an injection administered, since which the pain in the abdomen has increased.

4th.—The abdomen is more painful; abdomen tense; continued sickness. 11 p.m. died.

Post-mortem appearances.—Abdomen tympanitic. When cut into, a large quantity of air escaped from the cavity of the peritoneum, but no marks of decomposition existed about the body. The cavity of the peritoneum contained a large quantity of puriform fluid, and the convolutions of the small intestines, especially those that were found in the pelvic region, were united in various places to each other by recently effused lymph. The sigmoid flexure of the colon was very much dilated, and filled with large masses of hardened faeces. The mucous membrane of this part of the gut was for the greater part destroyed, the muscular tissue being laid bare; these appearances existed also in the whole of the rectum; but here in many places the muscular fibres were dissected off, and large sinuses ran in between them and the cellular tissue of the pelvis, which was thickened and condensed. At the lower part of the rectum, but out of the reach of the finger, there was a strongly-marked contraction, scarcely admitting of the passage of the index finger, where the coats of the gut were very much thickened. The cellular tissue around the gut was thickened and condensed, and the uterus and rectum were firmly united to each other with a long sinus communicating between them with the gut. A probe, passed from the gut into the sinus, penetrated into the cavity of the peritoneum by a small ulcerated opening with dark margins; the cellular tissue around the anus was enormously thickened, as well as the skin in the neighbourhood. Most parts of these tumours owed their origin to piles; but some of them appeared to be a simple thickening and condensation of the skin and cellular tissue: the

thickening appeared to depend upon chronic inflammation, and not scirrhus disease.

It was seen that the probe passed into the peritoneal cavity, the peritoneum having probably ulcerated, and at last gave way, just as it does sometimes in ulceration of the small intestines when no lymph is thrown out, and adhesion does not take place. Perhaps, however, when the injection was used, some little force was employed, which ruptured the ulcerated portion, and thus inflammation of that cavity was set up by a small portion probably of the contents of the gut passing into it. This shows the great danger that exists in all cases, where the disease is of much extent, of fatal peritonitis by contiguity, or by perforating ulcer, or by violence.

I have thus brought before you twelve cases—forming a series, and in fact—illustrating some of the diseases to which this part of the body is very liable.

[*Medical Gazette*, vol. v., new series, p. 138.]

OBSERVATIONS

ON ACCIDENTAL OR CONGENITAL OBLITERATION OR OBSTRUCTION OF THE VAGINA.

Sept. 12th, 1829.

Catharine H., æt. 27, admitted for amenorrhœa, with the following history. In November last she was delivered of her first child, which was still-born, by means of instruments. She suffered much during her confinement, and was very ill for some time afterwards, but recovered her health during the month. About a month after her confinement she had the usual precursory symptoms of menstruation, but no discharge of the secretion took place; and each month since that time (the last being the sixth period since her confinement) the symptoms have returned with increased severity at each successive period. She has much pain in the hips and loins, pain and bearing down in the vagina, sickness, slight febrile symptoms, with general disturbance of health. The abdomen swells, and is tender and painful, and she suffers much from flatulency, and experiences considerable difficulty in emptying the bladder or rectum, though there has been more or less difficulty in passing either evacuation even during the intervals between the periods of menstruation. These symptoms continue for nine or ten days, and then subside, leaving her comparatively well. The abdomen, however, has not lately recovered its proper size upon the subsidence of the other symptoms, but remains considerably swollen, though less than during the menstrual periods. She did not suffer much after her confinement from the lacteal secretion, but has been constantly obliged to use liniments to the breasts, as, at each menstrual period, the breasts enlarge and become painful, and milk

is secreted in such quantity as to escape from the nipples even without pressure.

At the request of Dr. Seymour, under whose care she was admitted, I examined her, and found the vagina totally obstructed by a very firm membrane, drawn in and puckered towards the centre, and feeling like cartilage. On passing a catheter into the bladder, the urethra was perceived to be pushed up behind the pubes as if by pressure, so as to require the point of the instrument to be turned nearly perpendicularly, instead of in the usual oblique direction. When the water was drawn off, a firm tumour could be distinguished by pressure on the abdomen, and a considerable prominence could also be felt by the finger introduced into the rectum beyond the point of obstruction, though no distinct sensation of fluctuation could be felt either at the obstructed point, nor on the abdomen, nor in the rectum.

It seemed evident, however, from this examination, that the uterus and upper part of the vagina were distended with thick substance, so as to obstruct the passage through the rectum and urethra, and it was probable at the same time that the obliteration of the vagina did not extend very far.

May 27th.—The patient being placed on a table, nearly in the position for the operation of lithotomy, I made a transverse incision, about half an inch in length, in the centre of the hardened cicatrix, and after dividing it cautiously, about three quarters of an inch upwards, I reached the distended portion of the vagina, through which a thick red semi-fluid substance, without smell, flowed to the amount of about twelve ounces before she was placed in bed, after which about a pint more came away slowly, during the next thirty-six hours, without pain or inconvenience.

29th.—This morning the discharge became completely purulent, all the brown matter appearing to have come away ; and about the same time that the nurse observed this change, the patient was seized with rigors, pain in the abdomen, and frequent vomiting. She has now an anxious countenance. Bowels not open since yesterday. Pulse 120, weak and small. She has twice taken some infusion of roses and Epsom salts without effect. As both Dr. Seymour and myself believed the symptoms to be those of irritation without inflammatory action, I injected some warm water into the vagina to wash away the purulent secretion ; an enema of castor oil was administered, and the following pills exhibited, which were repeated twice in the course of the day :

R̄ Pil. Sapon. e. Opio, gr. v.

Galb. Comp, gr. v. M. ft. Pil. ij.

In the evening, the bowels having been twice opened, she became easier with less frequent vomiting, and the pulse was less frequent and more full.

30th.—The discharge continues purulent, but in smaller quantity. The injection was repeated. The sickness is gone ; the bowels have been again

opened twice this morning; the pulse 110; countenance less anxious. There is still, however, a good deal of pain on the slightest motion, and pain is produced by pressure in the situation of the uterus, though not elsewhere.

Rep. Pil. Vespere.

31st.—There is now no pain or tenderness of the abdomen, and no pain on turning in bed. Tongue covered with a thick white crust. Pulse 116. She has eaten nothing these two days, but is not now sick. Ordered a small quantity of wine. She is menstruating, the proper period having arrived, and, in fact, she has not suffered so much the last two days as she generally has done before the late abortive attempts to get rid of the secretion; so that the symptoms during the last two days may have been as much owing to the state of the uterus from the performance of this function as to the irritation excited by the operation.

June 4th.—The tongue is cleaned, and she has gone on well till to-day, when a good deal of pain and tenderness returned on the right side of the abdomen, where a tumour is perceived, apparently in the situation of the ovarium, and there is also a good deal of nausea and sickness.

Hirud. *vj. parti dolenti.*

R̄ Mist. Camph. ʒx. Træ Castorei, ʒss. Træ Opii, *℥v.* M. 6tis horis.

These symptoms subsided, and the next day no tumour was perceptible, the pain and tenderness gradually ceased, and on the 9th there was no longer any local or general irritation. Weiss's dilator was now employed for some hours, which produced considerable pain by the distension, with a little bleeding from the cut surface; the pain went off, however, and the instrument was employed every day for some time; after which bougies were used, which caused less irritation than the dilator, and appeared equally efficacious. Under this treatment, which was attended with copious purulent discharge, the strictured part was gradually dilated, so that, instead of a hard circular band, more than half an inch broad, and feeling like cartilage, the surface became equally smooth and nearly as pliable as the rest of the surface of the vagina, though the canal still remained smaller than it should be. She was impatient, however, to return to her home, and promised to come again to the hospital if she experienced any inconvenience.

There is a great variety in the congenital deformities, or accidental adhesions, or new growths, which are found in the generative organs of females, producing some impediment in their different functions; some of which are of little consequence and easily remedied, others are of more importance, and require the most delicate and skilful surgical operations for their cure.

Nothing is more common in young infants than for some adhesion to take place between the sides of the labia, uncleanliness or some other cause producing inflammation of the mucous membrane; the adhesion being such

as occasionally to leave only a small opening near the urethra, and to draw attention by the pain or inconvenience experienced in micturition. The remedy for this adhesion is very simple; the forcible separation of the labia by the thumbs or the probe, or a slight incision with a knife, being sufficient to lacerate the adhesion; and a little piece of lint, dipped in oil, preventing their subsequent cohesion.

Sometimes, again, there is such a prolongation of the hymen over the orifice of the urethra, as to produce much difficulty in making water. A case of this kind is related by Warner, in his cases in surgery, in which the symptoms resembled those of stone; and after existing several years were cured by an incision. The most remarkable instance of this sort, however, is one related by Cabrolus (*Obs. Anat.*), in which the hymen was imperforate, and the urethra completely obstructed, so that no urine could be discharged by the natural passage, but it was evacuated from a tumour, projecting about four inches from the navel, and formed probably by the urachus. Cabrolus made an incision into the urethra, and tied the tube projecting from the abdomen; the patient, who was nearly twenty, being cured. In the *Phil. Trans.* there is an account of a case where the urethra was similarly obstructed by caruncles growing from the orifice after delivery.

Besides these malformations, which obstruct the flow of urine, and may therefore be discovered and remedied in children, there are other natural and accidental impediments to the sexual functions, the existence of which is not usually ascertained till the time of puberty or marriage. The obstruction may be either partial or complete; and it may be situated at the orifice of the vagina, or higher within this passage, or in the mouth of the uterus itself.

The hymen is often so firm in texture, that although an opening in the centre allows the menstrual secretion to be discharged, yet an incision is necessary for the consummation of marriage; or (if conception has taken place in spite of this obstacle) to facilitate parturition, such an incision being easily effected, as a director can be passed through the opening, and thus all risk is obviated. Ruysch (*Obs. Chirurg.*) met with an instance in which a second membrane was found higher than the hymen, and requiring a second incision during parturition. A similar partial obstruction to the function of generation is formed by contraction of the vagina, from the use of strong astringents, (*Saviard, Obs. Chir.*) from small-pox, (*Beckerus de Paidioctoniâ inculpatâ*), from lues venerea, (*Benivenius de Abdit. Morbor. Causs.*): and still more frequently from accidental lacerations and cicatrices in consequence of violence during parturition, of which numerous instances are met with in several authors, which have been cured by tents, by several small incisions round the obstructed part, by dilatation on a director, &c.; great care being necessary to keep up the dilatation for a considerable time,

to prevent subsequent contraction. The most remarkable instance of this obliteration, while the menstruation continued, is in Beekerus (op. citato), as the secretion was discharged by the rectum; and pregnancy took place, although the laceration, and subsequent cicatrization, had been so extensive as to obliterate the whole of the vagina intermediate between the urethra and rectum.

In these cases of partial obstruction, where pregnancy has taken place, it is probably advisable to operate as early as possible, so that dilatation may be effected, and the parts properly cicatrized before delivery; there must otherwise be considerable danger of more extensive laceration taking place during the expulsion of the child. * The operation is one which necessarily requires great caution; but as an opening exists, through which conception has occurred, there is at least a certain guide to the operator, who is in much less danger of injuring the bladder or rectum than in cases of complete obliteration, though the difficulties have appeared so great that Smellie even advises the performance of the Cæsarean section, where there are large cicatrices and adhesions in the vagina and os uteri. Callisen also gives direction for the vaginal Cæsarean section, where the os uteri has been closed by inflammation.

The malformation becomes still more serious when no orifice is left by which the menstrual secretion may be evacuated; this fluid being thus retained in the uterus and vagina, producing great disturbance of the health, and even becoming fatal if not discovered in time for the performance of a proper operation for its cure. The symptoms arising from retention of the menses from such a cause are accurately described by Sabatier (*De la Médecine Opératoire*), copied into S. Cooper's *Surgical Dictionary* (Art. *Vagina imperforata*). One circumstance, however, scarcely adverted to by Sabatier, is the sympathy of the mamma with the uterus, exemplified in the case I have narrated, and which sometimes proceeds so far as even to establish a vicarious secretion from this gland; the same thing having also been observed, "*per vias aeriferas, urinarias, alvum, digitos, cicatrices, oculous, nasum, aliasve partes.*"—(Callisen).—Of course, however, some exaggeration or misconception has arisen in many of these cases, so that I would not be considered as a believer in many of the cases referred to in the quotation.

The similarity in the symptoms of such cases to those arising from pregnancy, and the injurious suspicions often excited, have been frequently pointed out; the resemblance they bear to cases of amenorrhœa, and the necessity of manual examinations, are also evident from the instance just related. The operation for imperforate hymen is generally a very simple one, as the fluid retained in the vagina and uterus distends the membrane, so as to point out exactly where the incision is to be made. It must not be

forgotten, however, that the operation, however skilfully performed, is not wholly unattended with danger. In the last instance in which I witnessed the operation, the patient died in consequence of inflammation of the peritoneum. The fluid which is retained is in general perfectly free from putrefaction, however long the disease may have lasted (see *Mém. de l'Acad. de Chir.*), though the rule is not without exception (Sabatier, *op. cit.*) Where putrefaction takes place, death may often result from the irritation produced by this cause on the constitution; and even where it does not occur, yet suppuration ensues after the retained fluid has been evacuated, and the employment of opiates and soothing injections becomes necessary, to obviate the irritation which is excited. But some danger arises from the mere quantity of the retained fluid, which may be so great as to produce rupture of the fallopian tubes into the cavity of the peritoneum (De Haen, *Ratio Medendi*). Smellie mentions a case where three pints and a half were discharged by operation; and half-a-pint more came away subsequently, of the consistence of butter-milk; a quantity sufficient to distend the uterus, as in a case of pregnancy; and in the absence of the natural contraction of this organ, very likely to be followed by severe irritation, or fatal inflammation. In the case I have narrated I carefully abstained from pressure, but allowed the fluid to be expelled by the contraction of the uterus, and the pressure of the abdominal muscles; the discharge in this manner taking place very slowly in consequence of the consistence of the fluid, which is usually like treacle. Attention to this rule I believe to be the principal means of avoiding dangerous results.

Where the malformation is situated not at the orifice, but within the vagina, an operation becomes much more difficult and dangerous. Sir Astley Cooper mentioned to me a case in which he had made incisions to form a passage to the uterus, and had cut through not less than two inches of membrane without perfectly exposing the cervix uteri, though the result was successful, as it was followed by pregnancy. A lady, after eight years suffering, was operated on, and the surgeon passed his finger into a large cavity, from which a good deal of blood escaped, and which was believed to be the vagina; the patient died, however, in three days, and it was discovered that the cavity was that of the bladder, the death having been the consequence of the escape of the menstrual secretion into the abdomen, from a rupture of one of the Fallopian tubes.—(Sabatier, *op. cit.*)

The difficulty of the operation is necessarily still greater when the obliteration is situated in the orifice of the uterus itself (not the os uteri in the sense in which the term is employed by many authors, who allude to the subject of this paper, by which they mean the vagina), unless the cervix is distended and elongated by the fluid so as to communicate a sense of fluctuation to the finger. Several directions for opening the uterus when

thus enlarged, and containing menstrual fluid, or when, the cervix is obliterated subsequent to impregnation, will be found in Callisen, Syst. Chir. vol. 2, ccccxlviii.

Callisen (op. cit.) remarks, "*Accidentalis vel symptomatica vaginæ eoncretio totalis vix unquam occurrit.*" Such cases are, no doubt, more rare than the instances in which some small passage remains open for menstruation, and have been seldom recorded by modern surgeons, while much attention has been bestowed on the less important cases of imperforate hymen, a neglect which has induced me to throw together these remarks; but several cases are described by older authors, and I refer particularly to Beckerus, "*De Paidioctoniâ inculpatâ,*" and Roonhuyse, "*Med. Chir. Obs. English out of Dutch by a careful hand.*" The latter author, for instance, relates a similar case to that which I have detailed, where a woman had her vagina so completely obliterated by gangrene after delivery, "that she never had her menses any more." Having dilated the vagina with a speculum, the closed part was opened from above downwards by a lancet tied to the end of the finger. A pessary was afterwards employed, but neglected by the patient, and in a subsequent confinement a further operation became necessary, but the patient was allowed to be so long in labour before it was performed, that she died in three days.

These cases of obliteration of the vagina after delivery, are much more difficult to relieve by operation than most of those in which there is a congenital deficiency. It is probable that they scarcely ever occur without considerable loss of substance by sloughing, the consequence of which is the approximation in a greater or less degree of the rectum and bladder and urethra to each other, and their junction by a hard semi-cartilaginous cicatrix, unyielding, and difficult to divide. The intricacy and difficulty of the case, are necessarily dependent on the extent to which the obliteration has taken place; whether the sides are only brought together, or two or three inches of the vagina are firmly united, as in the latter case there will not be the distension of the vagina above the obliteration, separating the bladder and rectum from each other, and defending them where they are most loose, and where there is consequently greater risk of injuring these viscera. The operation becomes still more delicate when the sides of the uterus are also united together, which appeared to be the case in a patient of my friend Mr. Mayo, on whom he twice performed an operation (at the last of which I assisted), and succeeded in restoring part of the canal, though not in reaching the cavity of the uterus. There was in this case, however, no accumulation of menstrual secretion, and the health of the patient was restored, so that in all probability great part of the cavity of the uterus was obliterated, and the function of menstruation gradually ceased.

The operation is generally directed to be performed by making a perpendicular

incision, but it appears to me to be much better, in most cases, to cut through the cicatrix transversely, *i.e.* with one flat side of the scalpel towards the rectum, and the other towards the bladder; in which direction, I imagine, with attention to the anatomy of the parts, there must be much less risk of wounding either of these viscera than when the edge of the knife is held upwards or downwards, and there can scarcely be any risk of injuring the peritoneum, as the vagina is so little connected with it, that the puckering of the cicatrix is not likely to implicate this membrane. I need only repeat the necessity of attending to the after treatment, in the same manner as after the operation for imperforate hymen, and to the emptying both the bladder and rectum in all these cases previous to the operation.

[*Medical Gazette*, vol. iv., p. 457.]

CLINICAL REMARKS

ON

CONGENITAL ABSENCE OR OBSTRUCTION OF VAGINA.

August 1846.

1. Cases of Partial Obstruction of Vagina.—2. Case of Entire Obstruction.—3. Operation in a case of Entire Deficiency of Vagina.—4. Absence of Uterus.

NOT unfrequently the vagina, instead of having the natural elasticity and smooth mucous lining, is found, for more or less of its extent, hard and unyielding, and fibrous in texture. Now and then, there may be a narrow passage through the thickened part, so that the uterine secretions may escape, and therefore the health remains unimpaired. I was consulted in the case of a newly married lady, in whom I found about two inches from the orifice, an obstruction of hard substance, through which a small bougie could be passed. Having procured a series of short rectum bougies, of different sizes, I made two or three slight incisions by means of a Bistourie cachée through the contracted part, which was about an inch in length, and introduced a bougie, which was retained for several hours; and, by gradually increasing the size of a bougie retained for two hours daily, the part was restored to its normal size, and yielded readily when required in child-birth at a subsequent period.

But this change of structure is much more commonly attended with total obstruction, which is necessarily followed by retention of the menstrual secretion after puberty. You may here examine a preparation removed from a patient of one of my colleagues, after an operation which ended fatally. The vagina was natural below, but terminated in a cul de sac about an inch and a half from the external orifice, where the canal is for the next half inch entirely obliterated and fibrous; above this the canal is sufficiently

dilated to contain the head of a child, and was filled with a quantity of black fluid. An opening exists through the obstructed part, made by a trocar, into the cavity above, and in this upper part the vagina is thick and the rugæ are perfect, and it is lined with lymph. The body of the uterus was healthy, but you may see that the cervix is dilated so as to form part of the cavity for the fluid. Each fallopian tube has a cyst, about the size of a walnut connected with it; the ovaria are healthy. At the upper and back part of the dilated vagina, close to the peritoneum, was a mass of lymph in the cellular tissue, with signs of inflammation round it, and the veins in the neighbourhood contained pus. The peritoneum contained a quantity of semi-purulent fluid, and the intestines were glued together by lymph.

In this case, then, you see the usual nature of these obstructions, and you will perceive also that the cure by operation is by no means unattended with danger; but then, on the other hand, although the accumulation may go on for several years before it becomes so severe as to be discovered, yet in other cases it may be fatal, if not relieved, the greater part of the uterus becoming full, and then the fallopian tubes also, and the fluid may escape into the peritoneal cavity, with consequent fatal inflammation of that membrane. In some cases the accumulation is so rapid that great pain and urgent distress will take place in very few months after the first suspicion that the menstrual functions of the uterus and ovaria have commenced. On the other hand, such delay may occur as in a case twice operated on by Mr. Key in a girl of 15, in whom one scanty discharge took place after the operation, but although the wound reunited, and the obstruction was renewed, a second operation was not required till she was 22 years of age. In this case peritonitis came on in twelve hours, with pleurisy on both sides, and in the case which I have read from the post-mortem book, you may also see the usual cause of death, when the operation does not succeed, and you may deduce the rule that the incision required should extend as little as possible into the adjacent cellular tissue, dilatation being rather resorted to afterwards.

I will now read the notes of the case of our patient, Eliza Joyee, 22 years of age, admitted July 1st, 1846, who came in under Dr. Nairne, for debility, and was transferred to my care on the 12th, a tumour having been accidentally discovered in the lower part of the abdomen.

She was stout and healthy looking, but suffering from pain in the abdomen, not regularly, but worse from time to time, and somewhat corresponding to the monthly periods. She has never menstruated, and has suffered for four years with these uterine symptoms. There is an oblong swelling reaching from the rectum to the front and left side of the abdomen, where it projects considerably, the end being the size of a large fist, and moveable, but with pain. There is also a small tumour, the size of half a chestnut, moveable

and hard, apparently under the integuments, or possibly in the inguinal canal. The great tumour is tense and hard, but, from the rectum it yields enough to show that it contains fluid.

A catheter introduced into the bladder drew off some healthy urine, and the bladder appeared to be pushed somewhat to the right side. On introducing the finger into the rectum, it was found healthy, and about two inches and a half up the bowel the projecting smooth surface of the tumour was felt. Between the finger and the end of the catheter in the urethra, or bladder beyond the urethra, there seemed to be no vaginal cavity whatever, and so little thickness, that there could scarcely be more than the coats of the bowel and urinary canal. The urethra is surrounded by carunculæ, but the nymphæ are absent, which is the case whenever the vagina is not developed. The probe could be passed in no other direction than into the natural urinary canal. There is no vaginal opening, but, on stretching the part, about half an inch of mucous membrane is seen, but no feeling of any cavity.

I could entertain no doubt that the case was one of entirely deficient vagina, and of collection of menstrual fluid in the uterus. I may observe, however, that the fluid is so thick, and the distended cavity so tense, that there is little or no sensation of fluctuation, and my obstetrical colleague thought that the tumour was probably solid.

[Persons of great experience may be thus misled into an erroneous opinion. A young lady of 15 was brought from Ireland by her uncle, a physician, and I was requested to see her in conjunction with Dr. J. W. Ogle, and Dr. R. Lee, in July, 1860. Pains, like those of menstruation, had commenced in March, and had continued ever since, with one week's exception, and in June a swelling had been perceived; her health had suffered so much that she had become thinner and weaker. There was a large projection within the rectum, and a small hard body was felt below the integument in the left groin, where the pain was greatest. The bladder and urethra were perfect, and the vagina was totally obstructed about an inch and a half within it. I entertained no doubt of the nature of the swelling, but Dr. R. Lee believed it to be solid, and probably malignant. Mr. Arnott was then called in, and coincided with me in opinion; and, therefore, on the 21st of July I operated in the presence of these three gentlemen, and the young lady's uncle, dividing the soft mucous tissue transversely up to the fibrous obstruction, an inch and half in length, through which I passed a trocar, and verified the nature of the contents of the cavity. Passing a long probe through the canula, I withdrew this, and on the probe I introduced a female urethra dilator, stretched the hard textures sufficiently to introduce a lithotomy elastic tube large enough to allow of the free discharge of the retained secretion. Dilatation being

gradually effected by bougies, which were constantly worn, I was informed by her uncle, two years afterwards, that she was in good health, and the parts nearly natural and soft.]

July 20th.—Our notes say, three days ago appeared to be the menstrual period, and she has increased pain, and the swelling is larger and more tense.

On August 11th, she had regained her health and I proceeded to the operation, an injection being used some hours before, to empty the bowel. A silver catheter having been introduced, the water was drawn off, and the instrument kept in during the operation to separate the urethra from the rectum. A crucial incision was made through the mucous membrane between the urethra and the perinæum into the cellular tissue, which was carefully separated by a director and silver knife (the finger being held in the rectum), for full two inches and a half, at which point nothing but the thickness of the mucous membranes of the bowel and bladder seemed to exist. At the end of the opening thus formed, some hard substance resisted further separation, and much difficulty was experienced in not wounding the rectum from a sudden turn which it here made, by being pushed down by the tumour. Through this hard substance, about half or three quarters of an inch in thickness, consisting perhaps of the impervious cervix uteri, a flat trocar was passed in, which required some force to perforate the tumour, and some thick reddish fluid escaped, but soon stopped, and the canula, and a probe through it, could not be made to enter the cavity, the sides of the thick substance seeming to prevent it. A middle-sized round trocar was now used, and with difficulty made to pass on, and somewhat more of the same fluid escaped. A probe passed through it enabled the canula to be withdrawn, and a gum tube to be passed over it, which was fastened in by silks. About half an ounce of fluid escaped as she was carried to bed, and the tumour felt in the rectum was lessened, but pressure on the abdomen did not push any more down. It appeared as if both the rectum and the bladder were uninjured in the operation, no instrument having been felt exposed in the bowel. In the evening very little fluid had come away, and on attempting to inject a little water, she complained of pain internally; on withdrawing the urine, it was found slightly tinged with blood.

12th.—Passed a quiet night, but very little fluid has come away; the water passed naturally was quite clear, but in the afternoon it was again slightly tinged, and fluid escaping by the tube, had a slightly urinary smell. The tumour in the abdomen had much increased and was tender and tense, and her countenance was anxious. As it was obvious that the swelling was not sufficiently relieved, I withdrew the tube, and a long curved rectum trocar was introduced, and with some force made to pass into the main cavity, and a free discharge of thick menstrual fluid, of the same kind as the

small quantity drawn yesterday, now took place, with immediate subsidence of the abdominal swelling. About ten or twelve ounces having been allowed to escape, a plug was introduced, and three hours afterwards—five ounces more being allowed to pass—the plug was again fixed in the tube, as she became very faint, from the rapid withdrawal of the fluid. The water was slightly reddened when passed.

13th.—She slept a good deal, and a considerable oozing of fluid had taken place through the canula ; she complained of no pain, but the abdomen was tender. In the afternoon, the tenderness was more general, the pulse 120, she had vomited twice, and the countenance was sunk ; no fluid was coming away, the urine was clear ; a little warm water was injected, which oozed away slowly. Brandy and soda water, every two hours, with beef tea agreed, and she became comfortable, and by degrees she slowly recovered, wearing a bougie constantly to prevent the reunion of the divided parts.

Our patient has thus just escaped from peritonitis, having however had inflammation or irritation of the interior of the cavity, the sickness and fever arising from this state of things being relieved by small doses of calomel and opium, with brandy and such food as she could keep down.

The history I have read shows you how difficult it may be to operate successfully in a case of deficient vagina ; and the tinging of the water, and the other circumstances I have mentioned seem to show that the bladder was slightly injured. I conclude that both the rectum and bladder, which were so closely in contact with each other, folded over the rounded end of the tumour, and that although I felt and avoided the fold of the rectum, the trocar passed through the fold of the bladder, and led to such difficulty in the escape of the fluid of the cavity.

The difficulty of such an operation, as I succeeded in effecting, has been such that you will find Dr. Ashwell and other authors recommending the withdrawal of the retained fluid by a trocar through the rectum. But it must be remembered that this has produced a fatal result, and that if the patient recovers there is a constant danger of mischief, from such a fistula allowing the fæces to get into the uterus and cause irritation. A case is published by Amussat of congenital absence of vagina, with retention of menses ; in which, on consultation, M. Boyer advised that nothing should be done, as all such operations were fatal ; and M. Majendic advised puncture by the rectum. But Amussat endeavoured to make a way to the cavity of the uterus by gradual pressure, by means of sponge tents, and by the tenth day he reached the hard body of the swelling and punctured it with a trocar. He then enlarged the opening by repeated applications of the knife, and left in a gum catheter. There was some low peritonitis, and on the 19th day some of the fluid escaped by the rectum, and a considerable quantity so passed in the two following days, the pressure having perhaps caused a

sloughing of the coats of the bowel. The patient ultimately recovered, but I do not think the proceeding by gradual pressure advisable, from the history of the case, as compared with Joyce's case.

There may be in the last place, congenital absence of uterus, in which case the ovaria being present, there will be all the characters of the female sex, and at puberty there will be the normal function of those organs; but as there is no uterus, there can of course be no menstruation. Such a deficiency as this was brought to notice in a singular way some years ago, by a murder in which different parts of the victim were found in various places, and identified as belonging to a woman, whose friends testified to her having been different from other females by absence of menstruation, and medical examination of the remains proved the total absence of any uterus. More or less of vagina may exist in such cases ending in a cul de sac. You might suppose that it would be unnecessary to caution you not to mistake such a case for one of obstruction and retained menses; but yet I have known a dangerous and necessarily abortive operation attempted by mistake.

A lady between 30 and 40 consulted me, whose health had been very bad from the time she grew up, and whose symptoms of pain and sickness and tenderness of the abdomen, with much disturbance of nervous system, scarcely ever left her, but were regularly intensified every month. The vagina ended in a smooth soft cul de sac about two inches within the orifice, and while nothing could be felt within the bowel in the situation of the uterus, the catheter moved within the bladder came so closely in contact with the finger, as to show that nothing whatever intervened between the coats of these two cavities. Of course nothing could be done for such a case, which could only become cured naturally at the time of life when the functions of the ovaria ceased. Yet I found that some operation had been performed, attended with a good deal of hæmorrhage, by a rather irregular though largely consulted practitioner; and afterwards by a surgeon of deservedly high character in the country. Having written to him about this lady, he candidly confessed that he had trusted to the history of the previous operation, and had overlooked the real nature of the case, till he had attempted to enlarge the vaginal canal towards the uterus, which organ, in fact, never existed.

[The patient, Joyce, was removed from the hospital on the 26th still weak from the operations. At the end of October, she was well in health, but had not menstruated. In June, 1847, she was in service, and in good health, still having not menstruated, though she had some pain in the abdomen nearly periodically, though not with such a feeling of illness as before the operation. The new opening into the uterus was very contracted from insufficient attention to the use of her bougie to keep it dilated. I saw her again sometimes, and in June, 1849, the monthly discharge had been long

re-established, and she was in good health ; but within the last two or three months she had observed that when she menstruated a small part of the liquid came away with the water, while the greater part came by the artificial canal, in which a bougie was still worn. On moving a catheter in the bladder, the end could be made to enter a little way into a solid body, doubtless the uterus, but there was no evident communication between this opening and the new vagina, so that both channels must enter the cavity of the uterus, to account for the passage of the secretion in both ways.]

CLINICAL REMARKS

ON

CHRONIC INFLAMMATION OF THE TESTIS.

THE next disease which I will bring before you will be interesting to you, not from its rarity, as the last was, but, on the contrary, from the frequency with which you will meet with it in practice,—the case with which it may be cured, if properly and steadily treated,—and the length of time during which it may continue if the proper means are not used for its relief. I allude to chronic inflammation, or, as it has been called, “tubercular inflammation” of the testicle,—an example of which, after the disease has gone on to ulceration, you have in a man named James Miller, who was admitted under my care on April 7th. Our notes for that date tell us that “two years ago the testicle swelled, with little pain at the time, and that seven months since an opening formed, through which some seminal fluid escaped. The scrotum has since ulcerated to above the size of a shilling, and a portion of the tubuli seminiferi, with yellow deposit between them, has protruded. Four years ago he had syphilis, followed by secondary eruptions and sore throat. He has been treated with mercury. General health is, he says, pretty good. The ulcer is attended with no pain.”

By chronic inflammation is meant an inflammation, not of the cellular structure of the testicle, but of the mucous membrane lining the tubuli seminiferi. You are well acquainted with inflammation of this tract of mucous membrane when it is of an acute nature, as when it arises from an extension of the inflammation of gonorrhœa, proceeding along the vas deferens, globus minor, globus major, and so into the body of the testicle. But in the acute form no yellow matter is deposited in these tubes, in which circumstance it differs materially from the chronic disease, to which the yellow deposit gives its peculiar nature. The yellow matter is deposited in the seminal tubes themselves, and collecting, gives rise to dilatations in them, often of large size. These may be distinctly seen by making a section of a

testicle so affected, and washing away the deposit. This matter often ruptures the tubes, and is effused into the cellular tissue enclosing them. That excellent surgeon, Sir Astley Cooper, whose work upon diseases of the testis is in many points the best you can consult, speaks of "the cellular membrane of the part being loaded with a yellow fibrine, or coaguable lymph;" but I believe that a very great portion of the deposit found in the cellular structure escapes after the tubuli have burst. The yellow matter may be formed in very great quantity, as in this preparation, and may yet be removed by absorption without any of it being discharged by an external opening. In some cases, after ulceration of the scrotum has taken place, the deposit pushes out before it a portion of the tubuli, and this is one circumstance which forbids the removal of the protruded part.

You will find it stated in Sir A. Cooper's work, that the most common cause of the disease is an affection of the urethra. I do not think it is so, though it does occasionally produce it: for instance, a medical friend consulted me who had an enlarged prostate, and in him this disease of the testis was brought on in consequence. It is not common, however: at all events, you must not attempt to cure the disease, as Mr. Ramsden and others have proposed, by passing bougies to remove imaginary strictures, or even real ones which had no hand in forming it. In fact, in the majority of cases, it occurs without any connection whatever with the urethra. Patients liable to this affection are generally of a cachectic habit, indicated by a small irritable pulse, and sallow countenance; they are weak, and are very liable to derangement of the digestive organs, evidenced by a loaded state of the tongue. However, there is nothing definite, and patients with these symptoms will often tell you they enjoy very good health.

In such patients the disease frequently arises without any assignable cause. It is not the same form as that which arises in persons of the scrofulous diathesis. The yellow substance is different in its nature from the cheesy matter of scrofula: the latter is an unhealthy form of lymph, the former is a peculiar secretion.

The pressure of this substance causes the tunica albuginea to ulcerate; the scrotum is afterwards perforated, and the disease puts on the appearance you saw in the patient upstairs.

In its earlier stage this chronic inflammation is not unlike the enlargement which takes place when the testicle is affected with fungus hæmatodes; and formerly many testicles were removed which, by judicious treatment, might have been saved, and I have seen it done myself. Mr. Rose, who preceded me in office at this hospital, was consulted in a case well illustrating this. An officer had had one testicle removed; the other enlarged considerably and was about to be removed also, when, naturally anxious concerning the result, he requested to have the opinions of some other surgeons with regard

to it. It was decided that remedial measures should be tried. The consequence was, that the testis gradually regained its healthy size, and the surgeon was saved from doing an irreparable injury to his patient. In the early stage of chronic inflammation, then, the uniform hardness, and the distinction between the body of the testis and the epididymis, are greater than they are in fungus hæmatodes, because in the latter disease the swelling not often affecting either of these bodies, the distinction between them is not so apparent, the malignant tumour being only bound up within the tunica albuginea with the testicle which is often spread out and elongated over it. As the disease advances, the inflamed testicle presents irregularities upon the surface, and if matter forms, a second stage is produced, which presents greater similarity to the malignant affection, some parts in either case being softer than the rest; and some cases may arise where you will be somewhat at a loss to distinguish between them. When the case has attained a considerable size you can have no difficulty, as in a man from whom you have recently seen me remove a very large testicle. Both testes are not unfrequently affected at once, or one after the other, in chronic inflammation, which is very seldom the case in medullary tumours; the man from whom I removed these two testes *after death*, came under my care with considerable enlargement of the testis of both sides, besides which he had ascites and a morbid enlargement in the situation of the liver, with much falling away, and a very sallow complexion, like that of a person labouring under cancerous disease; mercury being given him, however, for his large liver, the tumours nearly disappeared, as you may perceive in the testes, and the disease of the liver proved to be of a common form. But in an earlier stage, should you be in doubt, you must give your patient the chance of recovery by appropriate treatment, and if this prove unsuccessful you may safely proceed to operation, having taken care that mercury is not given to any injurious extent, and having waited till its effects have in great measure gone off.

A resemblance is also given, in the latter stage of the chronic inflammation, when the fungus of the chronic enlargement—red and prominent, and of great size, perhaps—looks like the fungus of medullary disease; but a very little examination shows the difference between the soft bleeding fungus of the latter, and the granulations and projecting tubuli of the former cases. You may observe that there is a history of syphilis connected with this case; but there is no account which would lead us to suppose that the affection of the testicle was here dependent upon any syphilitic taint. When that is the case, the gland becomes affected at the same time with the appearance of secondary eruptions and sore throat. No difference, however, need be made in the treatment, as remedies which cure one are proper for the other, the disease being essentially the same in the syphilitic as in the idiopathic form.

It is curious to observe the tendency which exists in the minds of most medical men to theorize, although our profession is principally one of observation. In speaking of venereal inflammation, Sir Astley Cooper says, "that he supposes that it begins in the tunica albuginea from its analogy with periosteum and other fibrous textures, which are affected in syphilis;" in reality, however, the disease begins in the mucous surface, I believe, whether the swelling arise from a blow, or from syphilis, or without any known cause.

The scrofulous inflammation is most common in children, as you would expect, since the cellular tissue, which is the common seat of scrofulous inflammation, is most abundant in young subjects, and it forms in one or sometimes in two parts, a cheesy substance being deposited, and sometimes going on to suppuration, of just the same character as if the strumous action were in the cellular tissue of the arm or leg; and, moreover, the treatment necessary for the chronic inflammation is actually injurious in the scrofulous disease. But the disease I am now describing most frequently occurs in adults (when the vessels which secrete the semen are most active), because it is in the secreting structure of the gland that the deposit takes place; and it would appear that excess may give rise to this disease. There are few affections which you may treat with such success; and I will now enumerate the remedies you are to employ. The horizontal posture, with proper support for the testis, is to be strictly observed, so as to prevent the undue congestion produced by the weight of the column of blood in the spermatic veins. Mercury is to be given, so as to keep up a gentle action on the gums. You will find calomel and opium the most effectual form of administration. I have given the blue pill to a patient with but little effect; and, upon changing it to the calomel and opium, I have quickly succeeded in effecting a cure. In many cases some tonic, of which sarsaparilla is, on the whole, the best, is also required, sometimes at the commencement, if the patient looks weak and out of health; in other cases after mercury has been given for two or three weeks. You may in some instances find the bichloride of mercury given with the sarsaparilla or bark, a better form of administration than the others. The mercury is to be given so as gently to affect the gums, but without any salivation; and in a few cases, when scrofula or some other circumstance prevents the mercury from being borne well, some iodide of potassium will do good, but you cannot generally rely upon it. This was the treatment you saw used for Miller. On the 9th our notes tell us the following prescription was ordered:—"R Hydrag. Chloridi, gr. iss.; Pulv. Opii, gr. ½, o. n. s., and an ointment of the red precipitate of mercury to the ulcer." On the 16th—"Ulcer quite clean and healthy; mouth slightly affected: Capiat Pil. o. alt. noct.; Haust. Cinchonæ, ʒiss.; Conf. Aromatici, ʒss. bis die sumend; slight pressure to be applied to the testicle." On the 24th—

"Ulcer granulating healthily, and the surrounding skin is uniting to the testicle; there is no prominence of the tubuli, and the testicle is rapidly regaining its natural size." On May 3rd the report is—"The testicle is now no larger than natural, the ulcer is healing, and the granulations are small and healthy." Perstat cum pilulis.

So that the ease has progressed as favourably as could be wished. And with such treatment as this almost any case may be cured, the time, however, varying according to the power of the constitution to bear the mercury, but about five or six weeks will be the usual period for which it must be continued. Sir A. Cooper recommends the use of leeches twice a week to the testis, but they appear to me to be quite unnecessary. Cases, notwithstanding, may occur in which the treatment, although the chief remedies are the same, is not always so simple. I will read to you the notes of two other cases which you have lately seen, in order to point out to you the appropriate treatment in some other circumstances.

James Nutt was admitted under my care on December 16th, 1846. About fourteen months before his admission the left testicle swelled, and continued to increase for three months, when the scrotum became much distended, and an abscess formed, and burst. He then, for the first time, put himself under treatment. A portion of the contents of the swelling protruded, and was removed by the knife. After this he neglected to take any medicines for three months, during which time a poultice only was applied. A further portion was then shaved off; there was consequently only a small part of the testicle remaining, and that was decreasing rapidly. The right testis began to enlarge about seven months before he entered the hospital, and, at the time he came under our notice, was about eight inches in length, firm, and red on the surface, with fluid in the upper and lower part of the tunica vaginalis, the central portion being adherent.

In the left testicle you will observe the protruding tubuli have been removed; consequently, between the knife and the absorbing process, very little of the structure of the gland remained. Both testes were affected. The left testicle will serve as an illustration of another point in the treatment. You saw that no other local application was used in Miller's case than red precipitate. Nitrate of silver lotion is also a good application. You need not shave off the fungus, as was done in this case: you cannot know whether all the tubuli are diseased, and some may remain capable of performing their healthy function which the excision would have removed. Nor need you, as was recommended many years ago, cut off the protrusion, and, bringing the edges of the scrotum together, endeavour to get union by the first intention. You will generally fail, and run the additional risk of having matter confined by union of the skin without union below.

Very large fungous projections will be absorbed without any cutting, and

in the same time which the disease would otherwise require to be cured. On one occasion a gentleman who was attending my lectures brought to me at the conclusion of one of them a friend who had one of the largest swellings of this kind which I ever saw. The testis was not less than ten or eleven inches long, and about four broad, and the fungus was probably three inches in length, and an inch and a half high. The patient had consulted a surgeon two years before, who told him the swelling was a hydrocele, and advised his waiting for some time before operation ; and he did wait, till it had attained the size I have mentioned. Yet, in about six or seven weeks, the fungus was absorbed, the part healed, and the testis nearly of its natural size, by rest, and mercury and sarsaparilla.

Nutt was put under very nearly the same treatment as you have seen used for Miller, and with the same success. Sarsaparilla, however, was substituted for the bark, as I did not think his constitution would bear the latter medicine. His case also presents another point for consideration ; there was a collection of fluid in the tunica vaginalis. This is not an uncommon complication, and it is not necessary that any specific treatment should be adopted for its removal : it is generally absorbed as the testicle reverts to its natural condition. If it should not be, you may treat it some time *afterwards* with advantage ; but to inject the hydrocele at the time would be sure to reproduce the inflammation of the testis. In our patient I punctured the swelling at the upper part, but it was because the skin over it was red and inflamed, and I thought it possible that matter might be forming.

Another patient lately under your notice in the same ward, but whose case I am prevented from reading to you for want of time, had numerous abscesses in the testis, in addition to the fungous protrusion. Sinuses are apt to form in this way, and are difficult to heal, because the secretion of the testis finding its way into them keeps up a perpetual irritation. If a sinus completely pierce the body of the gland, as sometimes occurs, you may pass a seton through it for a few days, which, by producing inflammation and effusion of lymph, may perhaps effect a cure. This you saw done in Stewart with much advantage. You saw in him also that inflammation took place in the tunica vaginalis, which led me to puncture it with a grooved needle, to evacuate the fluid, which seemed to be only serum. In three or four days more, however, I was obliged to open the tunica again, because mixed with the serum was some pus, an abscess in the testis having burst into it ; and in such a case a larger opening is often necessary, because it is difficult to find in the distended bag whereabouts the orifice communicating with the testis is situated. In this man it seemed nearly closed when he left the hospital, though some sinuses remained in each testis.

If a sinus remain unhealed, in the generality of cases you need not

remove the testicle, as used to be done. I have known one or two sinuses to continue for upwards of fourteen years, occasioning only a trifling degree of inconvenience, in a gentleman, both of whose testes were much enlarged. Once only have I been obliged to perform an operation on this account, and that was in a patient in whom numerous abscesses formed in the cellular tissue of the abdomen and the under part of the thigh ; and, he requesting to have the testicle removed, I gave my consent, as the disease was wearing him out by the anxiety and suffering it induced.

I was consulted not long since by a medical man who had been advised to submit to the removal of the testis, but it was not impossible that some tubes might remain healthy ; and, even if the use of the testis is altogether lost, I do not see why a painful operation, not altogether without risk, should be performed, and particularly when, as in this case, both glands were partly affected. I therefore recommended very small doses of mercury, as he was afraid of phthisis, with sarsaparilla and iodide of potassium ; and under these remedies the tumours were nearly reduced to the proper size, and the sinuses nearly healed, when I saw him last.

[*Medical Gazette*, vol. iv., new series, p. 942, May 28th, 1847.

DISSECTION OF TESTIS IN A CASE OF CHRONIC INFLAMMATION.

YOU have recently seen a case, with peculiar head symptoms of a mixed character, which has ended fatally, and to which I direct your notice next, on another account also.

Joseph Camplin, 32 years of age, was admitted on the 25th of last month, on account of diseased testis, to which affection we will return presently. When I first saw him, two days afterwards, I observed a singular manner—hurried and nervous—with hasty mode of speaking, and an expression in his eyes like that of a maniac, which made me direct inquiries to be made of his wife, whether he had ever been out of his mind, or had been delirious ; and it appeared from her account, that he had been a potman, but had not lived intemperately since she had known him, and she had never heard of his having had delirium ; but yet, having been recently at the Convalescent Institution at Carshalton, he had been there restless and not easily confined to bed, though not positively delirious. He also complained of some pain in his head, especially at night ; his bowels were also generally constipated, but his pulse and tongue did not indicate anything of importance.

On the 28th and 29th he continued very odd in manner ; and, as the notes say, more muddled in his head ; and, on the 30th, it is remarked that he passed a restless night and was constantly endeavouring to get out of bed, for which half a drachm of laudanum had been given him by the

house-surgeon, which had procured an hour's sleep; and the bowels not having acted for two days, senna was also given twice before it acted.

There was something unusual in the symptoms before this delirium completely showed itself: but yet the delirium itself was now just such as a potman might be supposed to be liable to, and accordingly, as he became worse in the evening, some more opium and some gin were given, with the effect of making him more composed during most of Jan. 31 and Feb. 1. On the 2nd he was sometimes delirious and restless; and when spoken to, began a rational answer, and then finished by incoherent rambling; and, on the 3rd, began a new symptom, namely, a tympanitic state of abdomen, with constipation.

Calomel and opium and senna, with some gin and nourishment, were administered, and a blister applied to the neck. Spots, like those of fever, also showed themselves on the abdomen. The delirium then became muttering and low; more swelling of the abdomen took place, and he died comatose early in the morning of the 4th.

The right lung was adherent to the pleura all over, and contained, as you see, several small vomicæ and numerous miliary tubercles in various parts, and was much congested. The left lung was also congested, and filled with small tubercles; and there was some serous fluid in the pleura. The auricles and ventricles of the heart contained dark clots of blood, and the latter were contracted. The anterior mediastinum contained these strumous glands, which are enlarged considerably. The liver was dark-coloured and soft on the surface, but light in its substance. The glands in the ileum were enlarged, and there were several strumous ulcers in the cæcum, which have, as you perceive, spread to some size; and hence, doubtless, the tympanitis. You may also see how contracted and wasted the left kidney has become, and how large, therefore, is the right kidney, in order to perform double duty. There was some rather opaque serum under the arachnoid membrane, and the lateral ventricles were much distended with fluid. The fornix and optic thalami were soft, though not so softened as in perfect inflammation of those parts. Still, it is probable from these appearances, that there had been some inflammatory action of low character mixed with delirium tremens; and it may serve, to make you understand how difficult it often is to recognize the exact nature of morbid affections of the brain, since exactly similar symptoms may arise from totally different conditions of that organ.

But Camplin's death has given you an opportunity of seeing what you cannot often examine, namely, the early stage of a form of chronic inflammation of the testis, or tubercular disease, which you can contrast with the really scrofulous affection of the epididymis, of which I recently described to you an example. Camplin came in for a hard swelling of the

epididymis, which began in August last, and was attributed to his having struck it while moving a hogshead of sugar. He took little notice of it till six weeks ago, when it became larger and more painful; and he applied some leeches, and was obliged to lay up, and went, a fortnight before his admission, to Carshalton. On his admission there was hardness and slight swelling of the whole length of the epididymis, and the vas deferens was slightly hardened near the testis; the thickening appeared to go a little way into the centre of the testis, but the whole of the tubular part was perfectly soft and healthy. It was too extensive for the strumous disease, which is generally in one or two tubercles, and yet the entire freedom of the tubuli from disease is not common in the ordinary fungous testis of chronic inflammation. The affection, to the feeling, resembled most the hardness left by inflammation, extending from the urethra, along the vas deferens, to the epididymis, and yet the cord was unaffected, and he had had no gonorrhœa or other urethral affection. You see, however, in the section, very clearly the manner in which chronic inflammation affects the tube, the convolutions of which are seen very much dilated, so as to be quite patent; and you can squeeze out of them some of the yellow deposit, which is the result of this peculiar disease, and which, in the later stages, is in considerable masses between the tubuli and folds of the vessels of the epididymis, as well as within all the tubes themselves. The patient himself, on his admission, said that he had the same disease as the patient in the next bed to him; and so the dissection proves that it really was, though I scarcely knew, when his head symptoms began, what the disease of the testis ought to be considered.

Mr. Hawkins then described and commented on another case, in which a large fungus protruded through the scrotum, and was quite cured by mercury, and made some remarks on the treatment of the disease, recommending calomel and opium in preference to other forms of mercury, which he had known fail in stopping the enlargement, though the same cases had rapidly yielded to calomel. [*Medical Times*, March 1854.]

ON MEDULLARY DISEASE OF THE TESTIS.

You may remember that in a former lecture [*ante*, p. 274], I described to you the symptoms of chronic inflammation of the testis, by the help of several cases, which had gone on to ulceration, abscess, and fungous projection. In that lecture I told you that there were two stages in which its symptoms were not unlike those of malignant disease, namely, early in the disease, and after the fungus has begun to form.

A man was admitted on my last taking-in day, May 5th (whose case you will do well to watch), with the following history:—"He has enlargement of the right testis, which is nearly of the size of a small ostrich's egg, though

somewhat more elongated: it is hard and uniform in consistence throughout, except for about an inch at the upper part, where fluid can be felt: it is painful when handled, and there is occasional pricking pain in it when left alone, extending to the loins. The serotum is red, and the veins are rather enlarged, particularly on the under surface. The vas deferens is not enlarged, and the epididymis cannot be distinguished from the testis. He first observed the testicle begin to swell five months ago, with very little pain. About three months afterwards, it became much more painful, and increased in size more rapidly. Its progress has been much more rapid during the last week. States that he has never had syphilis or gonorrhœa, and is not sure whether he ever received a blow on the testicle. He underwent a course of mercury five weeks ago, of a fortnight's duration, and his gums were very much affected, and are still slightly so. During that time he kept his bed. Leeches and blue ointment have been applied to the testicle, but without any good effect.

There is also a hard, moveable, circumscribed tumour, about the size of a half-crown, and a third of an inch thick in the centre, situated in the structure of the left mamma; there is no pain in it except when handled roughly, and only one part is elevated above the rest. There is no retraction of the nipple nor discolouration of the skin over it, nor adhesion to the skin. He first perceived it three months since. Countenance sallow and unhealthy; has no appetite; has been losing flesh lately.

On the first appearance of this man his case was very like one of chronic inflammation, but on further inquiry into his history there is every reason to believe that it is an instance of malignant disease, fungus hæmatodes, medullary disease, as it is called, a form of carcinoma. The dark appearance of the scrotum, and the enlargement of the veins, might be present in either case; but the vas deferens not being enlarged, and the impossibility of distinguishing the epididymis from the body of the testis make this tumour appear to be probably of the malignant nature. It is very seldom in the chronic enlargement that you are unable to distinguish between these two parts, for, the disease affecting the vessels of both of them, they retain in a measure their relative proportions; while in fungus hæmatodes, it is not generally in the body of the testis, but in some part of the cellular tissue, contained in the tunica albuginea, that the disease begins; and from the disease occupying one part only, it often conceals the structure of the testis, which may, however, generally be detected, if carefully examined, unaltered, and often spread out over the surface of the new formations: neither is the cord usually enlarged, except from the increase of the cremaster muscle in size, from having to support so great a weight; the vas deferens not being enlarged as in the chronic inflammation, though sometimes there is a varicose condition of the spermatic veins, with consequent enlargement of the

spermatic cord. I resolved to let him remain under the influence of mercury a little longer, and he is taking a small dose of calomel and opium with sarsaparilla; and three days after he came in, I punctured the upper part of the swelling, and let out the contained fluid, which was of a dark colour, alkaline, and coagulating entirely on the addition of nitric acid; and was, in fact, a hydrocele of a part of the tunica vaginalis, the remainder being adherent to the tumour. The gums became slightly affected by the mercury, and two days ago I diminished the frequency of the dose. The note for yesterday informs us that "he has some pain in back occasionally; health improving; appetite better; fluid has not collected again; tumour is rather more prominent in two parts than it was, one near the upper and one near the lower part of the testicle."

The chief point to make clearly out in these cases is, whether the glands are secondarily affected, as their being so makes an operation necessarily improper. You may sometimes discover this by feeling a tumour or fulness in the abdomen behind the intestines, formed by the lumbar glands, for these are the glands which are for the most part affected, as they receive the absorbents from the testis. Sometimes, but rarely, an enlargement takes place in a gland situated in the inguinal canal. The glands in the groin are never affected unless the skin be implicated in the disease. You may remember the case of Goodenough, who died with this disease, in whom I recollect pointing out a circumstance which should always cause great suspicion of the lumbar glands being affected; namely, an instinctive contraction of the abdominal muscles upon the slightest pressure being made, sometimes rendering you totally unable to press deeply into the abdomen. In our patient the fingers pass readily enough down. I thought at first that there was some suspicious hardness about the liver, but it has disappeared, and depended probably upon the contents of the colon. He has also, you will observe, a tumour in the breast. If I had seen it without knowing anything of the existence of the diseased testis, I should probably have considered it to be a simple chronic enlargement of the gland, such as not unfrequently occurs in young persons, though it is not common in individuals of the age of our patient. It consists of a hard, firm deposit taking place in the structure of the gland, generally strumous, and disappearing readily under treatment. But the probable existence of a malignant disease in another situation raises the suspicion that this also is of a malignant nature. It has not the character, however, of ordinary scirrhus, and I by no means consider it to be proved to be of that nature. If there should be no worse symptom in our patient, it will perhaps be right to remove his testis. Of the effect of that operation, and of the appearance of the testis after removal, you had an instance in a man named Hornbuckle, whose testicle I removed a short time since for this disease. In him the disease had existed for twelve

months, during the two latter of which it had been rapidly increasing. It is not usual for the vessels of the cord to be much enlarged, but in him you saw the veins were very large. I have also seen the spermatic absorbents loaded with medullary matter, but it is more common to find the glands of the abdomen enlarged, without any trace of the disease in the absorbents. This is the preparation of his testis, and you may perceive that there is a great number of cysts embedded in medullary matter. If there be no evident sign of the constitution being contaminated, you will be justified in removing a testicle affected with this disease. I removed one from a gentleman six years ago, and up to this time he has had no return of the disease; and I have seen others also of a similar kind. A favourable result is indeed very seldom to be expected, less frequently even than in carcinomatous disease of some other parts,—but by operation we get rid of a troublesome and painful tumour, which affects the mind by apprehension, and thus, and by the pain, hastens the deposit elsewhere; so that life is probably prolonged, if a cure is not effected. The disease is sure not to return in the part, because it is completely insulated, and enclosed in a dense covering, making the extension to the skin very rare, and easily detected; the operation is also free from hazard, compared with an amputation of a limb for instance, at least a fatal result is very rare, and the influence of it on the system is sometimes very trifling, as you saw in Hornbuckle, who soon left the hospital after the operation.

Of the condition to which a patient may be reduced by this disease, when left without operation, or when the disease returns after operation, you had a very good instance in a man named Goodenough, who died not long ago; his case being improper for operation on account of glandular enlargement in the abdomen. This case was remarkable also, because it was attended by a total obliteration of the vena cava. After his death the vena cava and aorta were both found embedded in a mass of enlarged lumbar glands. The aorta was pervious; but the vena cava, as low as the two iliacs, was completely obstructed by medullary matter and coagula; above the mass of glands it was unaffected. A most remarkable circumstance is, that there were no collateral veins found enlarged to carry on the circulation. The vena azygos was somewhat increased in size, but not much, and the mammary and epigastric veins were not at all enlarged. With this total obstruction of the vena cava there was but little œdema of the legs, and when he died there was none whatever. This case also presented another point worthy of your notice. It is not uncommon to find the lungs secondarily affected with medullary tubercles. I thought it probable that they were so in him. There are few stethoscopic signs to point out the disease, as the small parts of the lung affected leave quite enough healthy structure to admit air to pass readily between them as in healthy lungs; but he had for a long time a

sanguineous frothy expectoration, which is frequently seen when the tubercles begin to break down, or the intermediate lung to inflame. It turned out, however, to be only bronchial in its nature; but when considering the propriety of removal of the disease in one part, all such occurrences must be carefully taken into account. The case which is now up stairs differs in several points from the others which you have lately seen; and you will find it of great service to compare the history and progress of several cases of the same disease together. Were it possible that the present case was one of chronic inflammation it would be cured by his present treatment, but I have little doubt that the improvement in his general health will go on, and make him at any rate more fit for operation, if the disease is, as, I believe, incurable.

I remarked that, although the tumour was malignant in its nature, and that in such cases excision was seldom followed by a permanent cure, on account of the great chance which exists of the disease returning in some other part,—yet that, with a tumour occupying a situation which it did in our patient, and being perfectly insulated (and not, as in scirrhus of the breast, having bands running from it deeply into neighbouring structures), with the tumour itself rapidly increasing, and with the lumbar glands, as far as it is possible to tell, unaffected, and, moreover, with a state of health not very unfavourable for operation,—it was right to perform the operation of castration, and give the patient the chance of remaining, perhaps for a year or two at least, without any return of the disease, and without his present suffering. In this part, especially, one would perform an operation when there was less chance of effecting a permanent cure than in some other parts of the body, because it is one attended with but little risk, and with scarcely a possibility of return in the neighbourhood. It was accordingly done in this patient, after consultation with my colleagues.

Let me now say a word or two upon the operation itself, and afterwards upon the nature of the disease in our patient.

The notes for June 10th are—"Operation for removal of testis performed. An incision was made from the groin to the bottom of the scrotum along the tumour; another incision was then made so as to enclose between the two an elliptic portion of skin. The scrotum was then dissected off from the tumour; the skin was nowhere adherent. Two arterics, from which there was considerable hæmorrhage, had to be secured before the cord was divided, and a temporary ligature was passed through the cord to prevent its receding. The cord was then cut through, and the tumour, with the elliptic portion of skin, removed. Numerous arteries had to be tied. The edges of the wound at the upper part were brought together by sutures and strapping: a piece of oiled lint was placed in the lower end of the wound, and the edges brought

loosely together by strapping. The tumour removed was about five inches long, and two and a half in diameter."

I find it noted that the ether was perfectly successful, as, indeed, it has been in almost all the operations performed here.

When you have a large tumour, as this was, to remove from the serotum, it is as well to remove a portion of skin with it, as otherwise you have the loose skin forming a large suppurating bag, taking a long time to heal, and causing much trouble and inconvenience. Your incision should be made also from the top quite to the bottom of the scrotum, as well to afford facility for the removal of the diseased mass, as to allow of a dependent opening for the ready escape of purulent matter. There was a great deal of hæmorrhage during the operation: the vessels that bleed are principally situated in the septum, and the disease causes these to enlarge, so that bleeding to some extent is a frequent occurrence, as you saw in a patient whose testis I removed a few months back. I passed a temporary ligature through the cord before I divided it, as it helps the assistant to hold the cord down so as to enable you to tie its vessels without difficulty. It has twice happened to me that my assistant has let the cord slip from between his fingers; it is an accident of no very great importance, leading only to some additional hæmorrhage, but still the delay from the receding of the cord within the inguinal canal is better avoided, and a ligature put through before the division easily prevents it.

The vessels in the cord requiring ligature are sometimes numerous, but sometimes there are two only—the artery accompanying the vas deferens and the spermatic artery itself; they must be tied separately, not with the whole spermatic cord. The method in which I performed the operation was, as you saw, by first separating the testicle entirely from the serotum, and then dividing the cord, instead of, as is sometimes recommended, dividing the cord, tying its arteries, and then dissecting the tumour out by drawing on the lower segment of the cord. I think the method I used is the most convenient, and the amount of pain and the time required are nearly equal on either plan.

With regard to the dressing after this operation, the putting a piece of lint in the lower angle of the wound is a proceeding which should always be adopted; the interior of the scrotum always suppurates, and as the skin readily unites, if it be allowed to do so, matter gets confined, and you are obliged to make an opening at a later period, besides running the risk of more serious consequences. Two days after the operation you saw that I removed the sutures, and there is no fear but that the man will go on well as far as the immediate effects of the operation are concerned.

I have very seldom seen any bad consequences ensue from the operation of castration. There may be some immediate danger if there be any

enlargement of the lumbar glands,—a circumstance which, as I before observed, may escape the most careful examination. In one case where these glands were enlarged at the time of the operation, I recollect that the patient died with retention of urine and peritonitis, brought on by the very rapid enlargement which the abdominal tumour underwent. The same thing, however, may occur independent of any operation. I have seen it occur, also, even so late as some months after the removal of the original disease in the testicle.

Here is the tumour removed from our patient. It presents you with a very good example of the medullary form of cancer. You see the soft, white, brain-like mass from which it derives its name of *cerebroid* cancer, with an admixture of numerous cells, as is commonly seen in this part of the body; and you will also observe in it a circumstance which is less often met with. Here is a portion much harder than the rest, and similar in its nature to the scirrhus variety of carcinomatous disease, such as so frequently affects the female breast. The true structure of the testicle, with the exception of a portion of the epididymis, has entirely disappeared, and there is no evidence in the section whether the testis is converted into the new structure, or whether it is only spread over and concealed by it.

Such, then, was the operation, and the examination of the tumour shows that we were right in our opinion of its nature. This case is peculiar, from the enlargement of the mammary gland which exists, and with the nature of which we are not acquainted; the fact of the existence of a malignant affection in one part of the body would render it probable that a tumour in another part was also of the same nature, though its appearance and feeling are more like the simple chronic enlargement which often occurs in younger men. Since the operation it has been getting smaller and softer, and in this respect also it is unlike the progress of scirrhus in the stage in which the mammary tumour of our patient would be supposed to be.

I will now take you to another case of which I spoke in my last lecture, and which has unfortunately not done so well as was expected; the case of James Wild, whose testicle I removed, and in my remarks took occasion to speak of the little risk there was of any ill consequences immediately following the operation. He was going on very well at the time of the lecture; but two days afterwards a change occurred: on the 17th the notes are—“Shivering last night at 7 o'clock. Nausea, some pain in the abdomen. Fulness of right side below the ribs. Wound healthy, discharge less. Pressure on the abdomen causes no pain. Tongue white. 2 P.M. Has vomited a large quantity of brownish yellow fluid.” In short, he had a complete attack of peritonitis, beginning in a very low form of the disease, so that at first there was no tenderness of the abdomen; then tenderness

came on, but without tympanitis. Thus, on the next day, "Pulse feeble. Nausea in the morning. Breathing hurried. Skin hot. Tongue dry and loaded. 1 P.M. Sickness, with vomiting of yellowish brown fluid. Wound healthy. Shrinks from touch on the right side of the abdomen—no tympanitis. Has not passed any water since midnight; a catheter was passed, and about half-a-pint of dark-coloured ammoniacal urine drawn off. Countenance yellow and anxious. Slept pretty well." He continued to sink, and died on the night of the 19th, so that the disease carried him off in little more than forty-eight hours after the first occurrence of the symptoms. So rapid a progress gives us no time for the employment of any remedies likely to be successful in arresting its progress; I will not therefore trouble you by recounting the means used. I have placed upon the table some of the parts removed, for the purpose of showing you the appearances found at the post-mortem examination. Here is an encephaloid tubercle which was found in the left lung, and you see that it is exactly the same in structure as the mass of disease in the testis which I removed. The lung around, you will observe, is perfectly healthy. In the right lung two tubercles were found similar in structure and apparently surrounded by cysts, and entirely isolated from the substance of the lung. That on the left side is not so isolated, and appears as if a portion of the lung were changed into the new formation. From a consideration of these circumstances, you will perceive the reason of the absence of any signs of their existence during life. The tumours were small, and the unaffected part of the lung being perfectly healthy, no obstruction was offered to the carrying on of the respiration. The largest tumour also was situated beneath the sternum, an additional reason for its remaining undiscovered. In the abdomen were found all the morbid appearances usually produced by peritonitis of a low type. Pus was found in large quantity collected in the pelvis. There was no effusion of lymph, nor any increased vascularity nor adhesions of the surfaces of the viscera together, but purulent fluid alone was found,—an abscess, in fact. The cause was obviously the existence of this tumour, which I now place before you. It is formed by a malignant enlargement of the lumbar glands, and is, as you see, about the size of a goose's egg. It was situated on the lower lumbar vertebrae, having the aorta and vena cava in some measure adherent, but pervious. In a case I mentioned to you in one of my earlier lectures on this subject, these vessels were found embedded in a mass of disease of this nature, and the vena cava quite obstructed. Had the case now under consideration gone on to a further stage, it is very possible that the same change might have taken place in it also.

The question may occur to you, how far the operation might have been concerned in hastening the patient's death. The sudden increase of a tumour of this nature may give rise to peritonitis, independent of any

operation being performed. You may remember a patient under the care of Dr. Nairne a few months back. His testicle, affected with encephaloid disease, had been removed from the inguinal canal, it not having descended into the scrotum. Six months afterwards he had an attack of peritonitis, similar to that of our patient. He had at the same time acute pain in the leg, extending over the whole limb, with great swelling and oedema, these symptoms depending upon the interference with the return of venous blood from the limb by phlebitis of the iliac vein. He recovered from the peritoneal attack and left the hospital, but died some time afterwards, and at the post-mortem examination Mr. Hewett found a large mass of malignant disease occupying the situation of the lumbar glands. Yet, although peritonitis may make its appearance in a patient upon whom no operation has been performed, or at a distant period after such operation, I cannot but think that it was in our present case in some way connected with the removal of the tumour. You will observe that the lumbar tumour was not satisfactorily discovered before his death, although you may remember that I hinted at the probability of one existing, from involuntary resistance made by the abdominal muscles to pressure on the abdomen. Had a tumour of the size of the one before you been there before the operation, we could hardly have failed to have discovered it, but there was not sufficient proof to deter us from the operation. It seems not unreasonable to suppose, the tumour being situated in the absorbent glands, and considerable suppuration going on in the scrotum and about the cut end of the cord, that the lymphatics of the cord taking up some of the pus, and conveying it to the glands, might have produced so much irritation, as to cause a rapid enlargement of the tumour already existing, and so have given rise to the inflammation of the peritoneum which has terminated in his death, and such I believe to be the fact in such cases; and in one which was fatal like this, from peritonitis, the tumour became in a few days of immense size from numerous cysts, though not perceptible before the operation.

There was another point of considerable interest connected with the question of the propriety of performing an operation in this case. This was the existence of a tumour in the breast, with the exact nature of which we were unacquainted. After his death I examined it carefully with the microscope, as well as the breast of the opposite side, and I could perceive in the affected side not the slightest trace of malignancy. It was, in fact, just the kind of tumour you often find in the male breast, particularly in young men, partly fibrous, and partly hypertrophy of the glandular structure.

[*Medical Gazette*, vol. v., new series, pp. 63, 404, 491.

July 9; Sept. 3—17, 1847.

CLINICAL LECTURE ON CASES OF INJURY OF THE KIDNEY.

George Froggatt, æt. 24, was admitted May 9th, at two o'clock in the afternoon. He was thrown off a horse this morning, and fell upon some railings on his left side, and afterwards upon the road. He could walk afterwards, but complains of pain on pressure at the lower part of the loins of the left side, and near the crest of the ilium, which parts are slightly bruised. No erepitis could be discovered. He says that he passed about a quarter of a pint of pure blood from the bladder about an hour after the accident, and has passed some blood in his water since his admission. There is no pain in the region of the bladder, and he has perfect motion of his legs. He has had pain in the loins some time before the accident, for which he has been under treatment. He has also slight cough.

5 P.M.—Pain much worse ; pulse quick and strong ; some sickness.

C. eruent. ad ℥viij.

Vespere.—Pain not relieved by being cupped ; still passes some blood in the urine, and also a large quantity of lithate of ammonia. Leeches ordered.

On the next day, the 10th, the notes say,—Still more blood in the water, with a larger quantity of lithate of ammonia ; bowels not opened ; pain lessened.

Calomel. gr. v. h.s.s. Sodæ Potassio Tart. ℥vj. mane.

11th.—Was sick last night ; bilious matter. More pain in the side, which was relieved by chamomile poultice. Still much lithates ; urine made transparent by heat ; consequently without blood, or nearly so.

13th.—Less pain ; but the urine is darker coloured from a little blood, but has less lithates. It is therefore transparent till heat is applied, when a little coagulum is thrown down.

Rep. Pil. et Haust. Sal.

14th.—Urine clear. [The urine has again contained some blood since the Lecture, but the man is going on well.—May 21st.]

Now here, gentlemen, I am inclined to think, from the nature of the injury, the sickness, the blood and lithates in the water, and the seat of the pain, is an instance of injury of the left kidney ; and as I think this organ is injured more frequently than you might suppose from the little that is said about it in books, I propose first to-day to make some remarks upon such cases. I shall not allude to wounds of the kidney, of which some cases are to be found, but of which I know nothing, as I have not seen an instance myself. I had the curiosity yesterday afternoon, to look through the indices of all the volumes of the two chief journals of the present day, the *Medical Gazette* and the *Lancet*, which profess to give very many reports, for the last twenty years and upwards, of cases of interest in the metropolitan and

provincial hospitals, and of those abroad also ; and yet, in upwards of eighty volumes, I only find reference to three cases : two of these are in the *Medical Gazette*, one of which is that of a patient of my own, and one is from the London Hospital ; and the third case is reported in the *Lancet*, from St. Bartholomew's hospital. Yet I believe I have seen a good many cases in which the kidney has been lacerated, or otherwise injured ; but (which is one reason why so little is written on the subject) a great many persons who, I think, have experienced such an accident, have afterwards recovered, as even those have done who have had the kidney directly wounded from without. Thus I only find in our post-mortem register, in the last three years, one fatal case recorded, which was in my accident week.

This was a man, Joseph Hunter, æt. 25, admitted August 8th, last year, in a perfect state of collapse, after a fall, I think, from a height, who died four hours after admission. There was no external appearance of injury, with the exception of the skin being discoloured over the right haunch. All the ribs of the right side were broken externally to their angles, the third, fifth, and seventh being again broken, two or three inches posterior to their junction with their costal cartilages. There was considerable effusion of blood in the right pleura, and the middle lobe of the lung was lacerated. In the abdomen the liver was superficially lacerated all over. The right kidney was also considerably lacerated, with effusion of blood into the peritoneum, and round the kidney. The right ilium was fractured obliquely from the anterior superior spinous process to the posterior, and there was much effusion of blood under the fascia.

1. Such a complicated injury as this would necessarily prove fatal ; and you see in it one mode in which laceration of the kidney may be fatal, namely, by hæmorrhage into the cavity of the peritoneum, with the addition probably, if the quantity of blood lost did not itself cause death, of the passage of some urine into the peritoneum, and its there producing its usual irritating effects.

Such laceration of this organ may occur from a fall, or a direct blow on the side, and is often accompanied by fracture of some of the lower ribs. It is, of course, more likely to take place if the kidney happen to contain a calculus, which will resist the blow from within, so that the structure is squeezed between two hard bodies. I remember a man being brought into the hospital under Mr. Keate, who thus, unfortunately, had calculi in both kidneys ; and one of them being ruptured, with the peritoneum in contact with it, the patient died of the hæmorrhage. Whether our present patient has had a calculus dislodged by his fall, or the kidney torn, I cannot say ; but you will observe that our notes mention his having been under treatment before the accident, for pain in the loins.

2. Secondly, the substance of the kidney being lacerated, with its capsule,

blood and urine may escape into the cellular tissue around it, without the serous membrane being torn ; and the fatter the person is, the more distant the peritoneum will of course be from the gland. A great quantity of blood may here be effused, and cause death by its loss or by irritation ; and the urine may add to this irritation, as it escapes from the lacerated part. It is curious that secondary hæmorrhage may thus be fatal some time after the patient has appeared to be going on well. There may be no blood, perhaps, in the urine, or it may have stopped, and on the third or fourth day after the injury there comes on sudden prostration, and pain and irritation, and the patient dies, and a great quantity of blood is found at the back of the abdomen, behind the peritoneum. I have seen this myself, both with laceration of the kidney and also of the spleen, in different cases,—the latest on the fifth day ; but of the two cases, which I mentioned as being recorded in the journals besides my own, one was said to have been an instance of secondary bleeding as late as the tenth day. It was in a man taken to the London Hospital after a wall had fallen on him, who appeared to be going on well, only complaining of weakness, till ten days afterwards, when he was suddenly seized with great pain in the loins and prostration of strength, and the abdomen became distended, and he died eight or nine hours after this attack ; and on examination, a great mass of blood was found behind the peritoneum, in the middle of which the kidney was found torn in half.

3. In the next place, there may be no laceration of the capsule of the kidney, but an injury may extend into the infundibula and pelvis of this gland, so that the effused blood escapes into the interior, and there is hæmaturia. The quantity that may be lost in this way is very great. A man, for instance, was brought to the hospital under my care, who had fallen from a coach-box, and probably had a fracture of part of the base of the skull. In the evening there came away with the water not less probably than three pints of blood ; and a great quantity continued for the next three days, so that he was very near dying of the hæmorrhage ; after which it gradually diminished, and he got well.

But you will naturally ask, how do I know that the blood came from the kidney at all ? In most cases, perhaps, of hæmaturia, the blood is derived from the vessels of the bladder, and is very often witnessed when the pelvis is fractured ; and it is curious that in many cases, where a good deal escapes, and you have no doubt of its being from the bladder, you can nevertheless scarcely find what has been its exact source. In our post-mortem register, for instance, is the case of a man, whom some gentlemen may remember, who was admitted in February last year, under Mr. Babington's care, and who had a good deal of blood in the urine. He had a fracture of the sacrum, and separation of the synchondrosis ilii, and of the symphysis pubis ; and in the bladder was a spot of ecchymosis : but it is noticed that there was no

lesion of the mucous membrane, though its vessels, in all probability, must have been injured to occasion the hæmorrhage. But there can be no doubt that in some cases of blood in the urine it is derived from rupture of vessels in the kidney, the injury being, however, not to any great extent. If a blow has been confined to the side, with or without fracture of the short ribs ; if there has been no fall likely to have done mischief about the bladder (and the ureter is incapable of bleeding much), particularly if the blood is equally diffused in the water, or is moulded, as in this preparation, to the shape of the ureter, you can scarcely doubt that the kidney is the source of the blood. In our patient there is some pain and bruise down the whole side, making the case less certain, and the blood first passed is said by him to have been nearly pure, which it more frequently is when the bladder is injured ; but this appearance is of course not at all inconsistent with a renal origin, if the bladder happens not to contain much water when the blood gets into it.

It is curious, however, that you will sometimes feel uncertain, even after death, when the injuries are somewhat complicated. A man was admitted under my care into the hospital, who had fallen from a scaffold about fifty feet, striking against the lower scaffold, and thence into the area. He was stunned for a short time, and remained in a state of collapse for some hours. He had several of his ribs broken on the left side, followed by inflammation of the lungs, of which he died twelve days afterwards. He had contusions in several parts, particularly in the right groin and pubes, and in the loins. He made water without difficulty or pain, but it contained a good deal of blood, giving it a dark colour, though without coagula : this began to diminish two days afterwards, but he had much pain in the left side and downwards towards the hip. The bladder seemed uninjured, with some coagula near it from separation of the pubes, the joint not being inflamed ; and the left kidney, which I supposed was the source of the hæmorrhage during his life, was much more vascular than the other, but I could not find any rent in its substance. The lung was much inflamed.

A man was admitted into the hospital after having fallen sixty feet from a scaffold upon some timber, among which were a number of iron bolts, and he supposes he must have fallen upon one of them. There was a small wound behind the anterior superior spinous process of the ilium, to the bottom of which the finger could not reach, and the glutei muscles seemed much torn away from their origin. A small piece of the spinous process was broken off, and a larger piece was found to be cut, as by a sharp instrument, along the whole length of the bone, but was not loose ; and there was also a fracture of the ramus of the pubes, close to the symphysis, with effused blood in both places. In this man, the bladder was the next day full, and required the use of the catheter ; and on the second day the urine was mixed with a large quantity of blood ; the third day it was again clear. This man was

very restless and weak, particularly after the bleeding in the water: there was some delirium, as if from depression; and on the third day the urine and faeces passed involuntarily, though the motion and sensation of the legs were perfect. He died on the third day, and, to show the source of the hæmorrhage with the urine, I found a little effusion of blood in the texture of both kidneys, with slight hæmorrhage in the cellular tissue round them, but no direct laceration of either. If, then, the bleeding, as I believe it did, took place in these cases from the kidney, it is evident that an injury, accompanied by hæmaturia, may implicate the gland so little as not at all to interfere with the recovery of the patient; and therefore in most fatal cases we may expect some complication with injury of the chest, or of the pelvis, the latter of which leaves the source of the bleeding somewhat in doubt.

4. Your diagnosis in cases of injuries of the side will sometimes be assisted by your finding the secretion of urine altered; in our present patient, for instance, you have seen the water much loaded with lithate of ammonia. A man was under my care with fractured ribs after a blow, who felt great pain in the side, and had bloody urine, the blood being diffused through it without coagula, and on the third day the quantity of lithates mixed with the water was not less than a third in height in the vessel which you looked at; but in a week's time it was all right again. The deposit of the saline ingredients of the urine is quite disproportioned to the fever produced by the accident, which, in our patient, has been almost nothing, and such an alteration of secretion, with blood, and with pain in the side or loins, following a blow over the short ribs, or on the lower part of the back, may be considered, I think, tolerably decisive of there having been some bruise or laceration of the kidney.

5. In some cases of injury you will find a mixture of symptoms arising from injury of the bladder, or its nerves, or concussion of the spine, besides what appears to be some injury of the kidney. A man was under my care for a fracture of the leg, occasioned by a fall from a tree in the Park: at first, the bladder was paralyzed, so that he required the catheter, the urine being healthy; then in a day or two there was deposited a great quantity of lithates, and shortly he had much irritation of the bladder, with constant desire of passing it, though he remained incapable of expelling it; then he recovered some power over the bladder, and a large secretion of mucus took place from this organ, in consequence probably of the deposit of the lithates to such an extent, and in the course of a fortnight all these symptoms subsided. Another man was under my care many years ago, about the time of those remarkable crimes in Edinburgh, connected with our profession, which gave a new name to the catalogue; this man, a tailor, unfortunately dreamt that he was being "Burked," as it was called, and, getting out of bed

in his sleep, fell from the top to the bottom of the house through a skylight, which perhaps broke his fall so as to save his life. He had a fracture of the pubes, and of some ribs, and being unable to make water, I passed a catheter, and found only one table-spoonful of blood and very high-coloured urine; for the next twenty-four hours not a drop seemed to be secreted: after this time a very small quantity was found, exceedingly foetid, very acid, and with copious deposit of lithates, and with sulphuretted hydrogen enough to colour the catheter; and it was several days before the natural quantity and quality of the urine were restored. On the third day, the bladder recovered a little expulsive power, which then again ceased, and it was nearly six weeks before the bladder and the muscles of the legs, which were also partially paralyzed, fully regained their power of contraction. The man finally recovered, and probably suffered from concussion of the spine, in consequence of which the functions of the kidneys were for a time suspended, as if their nerves were cut or injured in experiment.

6. A further consequence of injuries of the kidney seems to be suppuration within the organ, of which this case is an example. Charles Bradford, 24 years of age, was admitted under my care in October 1829, saying that a fortnight before he had fallen from a horse, and had had bloody urine two days afterwards, and at intervals since that time. Five days before his admission, an increase of pain took place, with fever, and pus came away in considerable quantity with the water. He had, on his admission, much tenderness on the right side, and constant pain referred to the right lumbar region, and there was much pus in the water. He had a full strong pulse, a loaded tongue, and anxious countenance, and he had previously had ascites, and had suffered from rheumatism, with disease of the heart. In the course of a month he went out nearly well, having previously had the irritation excited by the pus in the water propagated to the orifices of the vasa deferentia, so as to occasion hernia humoralis, and to the urethra also, producing a purulent discharge from that membrane, as in gonorrhœa. He was again admitted at the end of November, with some return of pain in the loins, abdomen, and chest, and cough, and other symptoms of hypertrophy of the heart, of which he was very near dying, and finally left the hospital nearly well at the end of December, no longer feeling any pain in the situation of the kidney.

This is the only case in which I have seen suppuration follow an apparent injury of the kidney at this early period, but in many cases of abscess in this organ and around it, which I have had under my care, or have witnessed, some blow or strain has been experienced at some former time, and has been said to have given rise to the train of symptoms which ended in renal abscess. Of the two cases I just alluded to as being recorded in the journals, one contained in the *Lancet* is said to have been an abscess of the kidney, opened

six months after an injury by Mr. Stanley ; the termination of the case, however, is not mentioned. Chronic inflammation ending in abscess need not occupy our attention at present, as whatever may have been its origin, the treatment necessary for it, does not differ from ordinary cases of disease of this organ.

7. There is yet one more effect of injuries of the kidney which I must mention in order to complete the subject. You will find, in the *Medical Gazette* of November 24th, of last year, an abstract of a paper by Mr. Stanley, giving an account of two cases of injury, in the first of which a boy was squeezed between the wheel of a cart and the curbstone, the consequence of which, besides suppuration about the pelvis, was the formation of a fluctuating tumour on one side of the abdomen, the urine passing naturally ; about nine weeks afterwards it was punctured, and nearly three pints of clear yellow fluid evacuated ; and again twice more at intervals of eleven and sixteen days. Three months after this four pints were let out, then only six ounces ; and after this the boy got well, or at least not suffering from what swelling remained. In the fluid which was drawn off, urea and the other ordinary ingredients of urine were found on analysis.

In the other case, the patient, a woman, who was knocked down by, and pushed before the wheel of, a cart, died about ten weeks after the injury. Two or three pints of similar urinous fluid had been drawn off ; and on examination, a large cyst was found behind the peritoneum, and reaching from the diaphragm to the brim of the pelvis ; and out of this sac a large irregular opening led into the pelvis of the kidney ; and it was concluded that in this and in the former case a laceration of the pelvis of the kidney had been produced by the injury. In the eighteenth volume of the *Medico-Chirurgical Transactions* [see *ante* p. 173], I published an account of a case from which I took the preparation on the table before us, which I believe to have been an instance of aqueous encysted tumour of the kidney similar to this transparent cyst of the kidney of another patient, which you see contained about half-a-pint of watery fluid. The boy, in this case, was admitted three weeks after he had been struck down by a carriage, and probably run over by it, with a considerable sized swelling on the right side of the abdomen, like an abscess in appearance, and occasioning much suffering. After a little while I let out eighteen ounces of water, with a little mucous extractive matter, but no albumen, and the boy died about three months after the injury, at which time the cyst filled the whole side of the abdomen, and contained about five pints of fluid. I say I published the case as one of serous or aqueous encysted tumour connected with the kidney : on looking at the preparation however, there might be some doubt whether this was not an example of the same kind of laceration of the pelvis of the kidney which Mr. Stanley has described, as there were two small communications, about

the size of pins' heads, between the sac and the pelvis of the gland ; but it differs most materially from his cases in the nature of the fluid, which, instead of being urinous in smell, and being found to contain urea, albumen, and other ingredients of urine, was almost pure water. The case being a remarkable one, I ventured to request Dr. Prout to examine the fluid, whose authority is quite decisive on a question connected with the urine ; and he was kind enough to say : "The fluid from the cyst is serous, and, after a careful examination, I have not succeeded in detecting anything urinary in it ; at least, if it contains urine, the quantity, I am satisfied, must be very minute." Now, that urine should escape into cellular tissue, and produce none of its usual inflammatory and sloughing processes, and collect in a large cyst in immediate contact with the peritoneum for several weeks or months, is, by itself, a very extraordinary circumstance ; but that urine should thus escape and form for itself a large bag, containing five pints of fluid, in which so experienced a chemist as Dr. Prout should detect nothing urinary, appears incredible ; and I am inclined, therefore, to adhere to the opinion I then formed, of its being a serous tumour, such as becomes developed in other parts of the body, and that the minute communication with the pelvis of the kidney was formed by an attempt to empty the cyst in that direction by ulceration, rather than by laceration after the blow. You can see the thin cyst, with the ureter running within it, and with a small third kidney formed of one lobule at a distance from the body of the gland. Still, however, it may possibly admit of doubt ; and Mr. Stanley's description of his dissection seems to show the possibility of an injury lacerating the pelvis or ureter.

It remains for me to speak of the treatment of injuries of the kidney. In the first place, with regard to the hæmaturia, it is seldom that its amount causes any alarm ; but if the blood comes away in great quantities, you have the same resources as in other internal bleedings, to which alone you can look for checking hæmorrhage from the kidney which does not pass down with the urine. You can cause syncope by bleeding, and you can give styptics, which I have seen do much good in some cases of hæmaturia. Of these the best is lead ; so that you can give three grains of the acetate with a quarter of a grain of opium every three or four hours for a time. In some cases, in which the lead failed, or alternately with it, I have seen the powdered gall stop the bleeding ; this was the case in the man from whom this long coagulum of the shape of the ureter was withdrawn, who took fifteen or twenty grains every six or eight hours with much advantage. This medicine is, however, rather nauseous, and sometimes irritating to the stomach. You can also give a dessert-spoonful of Ruspini's styptic every three or four hours. You might reasonably expect that, if these medicines have power in any case of hæmorrhage, they would be of especial service in hæmorrhage from the kidney, to which organ so large a quantity of blood is constantly

passing. Another styptic—turpentine—which is useful in passive bleeding from the kidney, does not seem to be applicable to the cases of injury in which inflammation is present. The presence of blood in the bladder does not usually occasion much trouble; it did so in the patient from whom this blood passed, and I was obliged to wash out the bladder to free it from coagula and enable the urine to escape, not after an accident indeed, but for fungus hæmatodes of the kidney. With a double catheter and warm water there is no difficulty in doing this, if you are obliged; at all events there can be no occasion to perform the high operation, as for lithotomy, which was done in one case by Mr. Copland Hutchinson, where blood lodged in the bladder. In most cases, however, you may disregard the amount of hæmorrhage, and treat the case as you would another in which there was no bleeding, and you will find it cease gradually in two or three days. I need not say that rest is necessary, and with this you must employ antiphlogistic remedies. You see that our patient now in the house, has been cupped once, and has had leeches also once, and fomentations to the painful side; and such means are usually enough. In the case, however, which I read to you, of recent suppuration, I was obliged to bleed as often as five times; cupping, however, is generally sufficient. Then you saw that I gave calomel and saline purgatives; and if you have occasion for purgatives in these cases, and particularly when the lithates abound, as they did here, the salts you select should be the vegetable ones, the potassio-tartrate of soda, or the tartrate of potash, so that the alkalis may at once pass to the kidney and neutralise the excess of acid. Then, again, you may give saline draughts, and add to this sometime some colchicum if the inflammation does not easily yield.

After the the first symptoms have subsided, you must next look carefully for remaining pain and weakness in the loins, and use counter-irritants; apply blisters, taking the precaution of using some muslin or tissue paper under them, in order that the cantharides may not be absorbed and pass to the injured or inflamed kidney; and finally, if such pain and weakness continue long, you should insert a seton or an issue over the affected part, which you will do with the view of preventing the formation of abscess or other chronic disease of the kidney, and also to obviate another future mischief, which has been pointed out by Mr. Earle, in a paper in the *Medico-Chirurgical Transactions*, namely, the formation of calculi in the kidney; though it does not seem very probable that these bodies would be deposited unless the patient's urinary secretion was otherwise disordered.

Such, then, is an account of the effects of injury of the kidney, which this case suggested to me as not unlikely to be useful, since I believe you will find little said about the subject.

[*Medical Gazette*, vol. xxxiv., p. 241, May 24, 1844.]

CLINICAL LECTURE

ON

SOME CASES OF DISEASE OF THE KIDNEY.

1. Hysterical Suppression and Retention of Urine, with Paralysis of the Bladder.—2. Suppression of Urine, with Inflammation of the Bladder.—3. Abscess of the Kidney from Stricture (?)—4. Calculi in the Kidney from Stricture (?)

I PROPOSE to bring before your notice, in to-day's lecture, some circumstances connected with a very important class of cases, of which I happen to have several under my care at present,—cases which are important not only on account of their severity and danger, but also on account of the insidious manner in which they frequently arise, and the obscurity which often prevails over the first part, at least, of their course,—I mean disorders of the kidney. You have many opportunities of observing the gradual and concealed dangers of these cases in lithotomy, and some diseases of the urinary organs, in which it so often happens that an organic disease of the kidney, unsuspected, on account of the patient's greater suffering in the bladder, is all at once aggravated, and becomes rapidly fatal, just when the operation, or the treatment of the stricture, has relieved the patient from his former tortures, and given him hopes of speedy recovery. The observation of one such case is sufficient to show you the risk of a hasty prognosis in any long-continued disease of any one of the urinary organs.

CASE 1.—The first case I will comment upon is one which I take to be merely a functional disorder of the kidney. This is the history in my book. The patient, Sarah Grover, æt. 20, was admitted into the hospital April 15th, having been ill three years. A cessation of the menses was the first symptom she observed, which continued for seven months; after this the discharge returned, and became regular as to time. At first the quantity was small, and it gradually increased to its natural quantity,—then it became more, and is now twice as much as it should be, and continues for five or six days, during which time she has considerable pain across the back and abdomen, and in the thighs, and she feels very weak and low; there is also a little leucorrhœa.

I pause for a moment to make you observe this derangement of the uterine functions, as it affords a key to the rest of her complaints, which are *hysterical*, as they are termed; and her constitution shows them to be of what I called, in the last lecture, the low form of hysteria,—her whole frame weak and trembling,—her mind desponding and dull, and she is incapable of being roused to any mental or bodily exertion,—her face pallid,—her pulse regular and weak,—her eye-lids and ankles inclined to swell, and to become œdematous. To add to her misfortunes, she has a hernia, and suffers from hæmorrhoids.

Then as to the urinary disorders.—At the time the menstruation returned, she was attacked with *retention* of urine, which has continued ever since ; so that she has, for about two years and a half, been unable to pass a drop of water but by the assistance of the catheter, which has been passed once or twice every day since that time.

Now this hysterical paralysis of the bladder is a very common symptom, and is often accompanied with paralysis of the lower limbs, so that the patient has complete paraplegia. It is generally wrong practice to have recourse to the catheter without the most urgent necessity ; and having now been done so long, years may elapse before she can leave it off again, the bladder having totally lost the habit of exertion. It is like the hysterical loss of voice, or of the power of swallowing : there is a want of volition ; and if the patient's mind is altered, or she is urged by hunger or pain, the partial paralysis will generally be removed. Since she has been in the hospital, the water has been sometimes allowed to accumulate for twenty-four, and once for forty-eight hours ; and when the bladder is thus full, she has been placed in the shower-bath, in order to induce muscular contraction, but hitherto without avail.

Next, as to her renal complaint.—The *quantity* of water has for a long time been extremely small, except when she has taken diuretics, of which, by her account, she has made frequent use ; but even then does not exceed $\frac{3}{4}$ viij. in the twenty-four hours ; and often, when the catheter has been passed, the bladder does not contain any at all. On her admission, the quantity was not above 3 or 4 oz., and it has varied from this to 8 oz. since she has been in. The *quality* of the urine is not much altered, for it is generally rather high coloured, and slightly scalds her as it is drawn off, and there is a little pinkish sediment occasionally ; that is to say, the quantity of saline matter secreted is nearly natural, though with very little aqueous fluid ; and therefore she does not suffer as from suppression of urine of a different kind, in which probably an accumulation of urea in the blood produces the dangerous and frequently fatal symptoms sometimes observed in such cases.

I believe, then, that this state of the kidney is *functional* only : there is no albumen, no mucus, nor other sediment, to make it probable that there is any organic change. This affection is called, by Dr. Prout, spasmodic : I hardly understand the term, however, as applied to the secreting texture of the kidney, and would rather call it hysterical or nervous ; *i.e.*, I believe it to arise from deficient nervous energy, of which the whole body partakes, but which is especially felt by the kidney ; it is the same kind of suppression, in fact, that may be produced in a greater degree by cutting the nerves of the kidney ; and you may observe precisely the same effects upon the secretion of the liver, both in experiment and disease.

With this view of the case, you will observe that my object has been to

strengthen her system as much as possible, and encourage her to exert herself. She has taken the steel mixture three times a day, with aloetic pills at night, and a shower-bath every day, or every other day.

She has continued this plan for above a month, with the exception of a few days, when she had a feverish attack, with erythema of the face; but it seems to have produced no very material difference. At first she seemed stronger and better, and the quantity of water increased from 3 or 4 to 8 oz., but it several times diminished again. The shower-bath always seems to do her good for a time. A few days ago, besides pain in one side or other of the chest, she had so much in the lower part and side of the abdomen, that I ordered a blister to the loins, which did her some good. I suppose, however, the steel must now be changed for some other plan, perhaps for some form of terebinthinate medicine, perhaps for cantharides internally, not merely with a view to the suppression of urine, but also to the condition of the bladder and uterus. A short time since, for instance, a young woman was under my care, with hysterical incontinence of urine instead of retention, which was completely relieved by the Chios turpentine. I ought to observe to you, that a more usual effect of hysteria upon the kidney, is a great increase of the quantity of water, and a dilution of the salts, instead of a diminution in the quantity, and a concentration of saline matter, such as this girl labours under.

[Since these remarks were made, Mr. Hawkins has ordered twenty-five drops of tr. lyttæ, in infus. calumbæ, three times daily.]

CASE II.—Our next case is also one of primary disease of the kidney, but with this difference, that the disorder of the kidney has actually produced disease of the bladder, instead of both being merely co-existent. This is the case of Ann Basset, æt. 57, admitted April 30th. It seems that she has been ill six months, during which time she has suffered the most acute pain in the bladder, so that she is almost incessantly straining, both day and night; the only relief she obtains being from sitting constantly over the steam of hot water. She is a good deal emaciated, and has lived a hard life.

Now this woman came to me two months ago, complaining of the pain I have mentioned, and imagining she had stone in the bladder, which, indeed, she still fancies. I examined her, however, and found only an inflamed bladder, without stone; and the introduction of the instrument gave such acute pain just close to the neck of the bladder, that I almost thought there must be ulceration of the surface of that organ. I ascertained, too, that there was no scirrhus disease of the uterus, which might be the cause of the inflammation, and which her age made me suspect. Since that time I did not see the woman till her admission, when it was evident that the disease was in the kidney, the following symptoms being apparent in addition to those of the bladder, which alone she then complained of.

The *quantity* of water was diminished, so that she did not make above four ounces in twenty-four hours, notwithstanding her incessant desire to empty the bladder of its supposed contents; and what little was secreted was altered in quality, being alkaline, peculiarly foetid, and of a very remarkable *greenish tint*, with a sediment deposited from it, consisting of an impalpable powder of a *blue* colour. You observed also, that there was a great quantity of tenacious ropy mucus, which, however, is secreted, not by the kidney, but by the mucous membrane of the bladder.

There is, then, in this case, an altered state of the secretion of the kidney, possibly with some organic change; but of this we have no direct proof. You observe, however, that she has no pain referred to the kidney, but all her sufferings are experienced in the bladder; because the urine having become alkaline, is rendered irritating to the mucous surface, which secretes a great quantity of mucus to defend itself from the effects of the urine, and is constantly acting to get rid of the irritating cause. The bladder is, in fact, in a state of chronic inflammation. You will find, however, that a much less alteration of the urine than is here present, is sufficient to cause the same reference of the disease to the bladder, making it highly necessary to examine the urine in all cases of apparently diseased bladder. For instance, the urine in young children is very often a little too acid, the consequence of which is, that they are brought to you sometimes complaining of all the symptoms of stone, sometimes of paralysis of the sphincter, and incontinence of urine; and either of the cases will be cured by some alkaline and bitter medicine, which quiets the disordered secretion of the kidney, and sets the stomach right.

Besides the alkalescence of the urine, our patient shows us a very singular deposit, which I do not recollect to have seen before, and which I can scarcely explain to you. You know, however, that besides lithic or uric acid, some other acids, such as nitric, are sometimes present in the urine, the effect of which is to change the uric acid into what is called purpuric acid, which is deposited, along with salts, in the form of a pinkish sediment, from the mixture of purpurates with lithate of ammonia. In the *Medico-Chirurgical Transactions*, you will find an account of a case in which the urine became quite black, and Drs. Marcet and Prout proposed to call the principle on which it depended melanic acid; and some other peculiar acids have been described, which seem for the most part to be modifications only of the lithic acid, by the presence of other acids with colouring matter. The greenish tint of the water, and the blue deposit, in this case, are probably owing, therefore, to some slight variation of the purpurates of ammonia, which are evidently modified as to their tints by many circumstances of admixture.

You will see at present that this patient has been very much relieved by

the treatment adopted, since she makes water much less frequently, and with comparatively little pain, so that she has become capable of moving about again with facility, and sleeping comfortably. The urine is almost entirely free from mucus, and is secreted in much larger quantities, and generally reddens the litmus paper, though there is still so much ammonia with the acids, that it is soon rendered alkaline, and smells offensive from the first. The peculiar blue deposit and greenish tint continue, however, little altered; so that, although the disorder of the bladder has been relieved, the disease of the kidney is by no means cured.

The treatment adopted has been the use of the warm bath, the soap and opium pill at night, and the exhibition of a mixture containing—

Decoct. Pareiræ Bravæ, ℥ij. ; Acid Nitric dilut. ʒj. ; Træ. Opii, ℥vj. 6tis horis.

She has used this from May 6th to the present time (May 22), with the benefit you have witnessed, and must continue the same plan a little longer. What further we shall have occasion to do for her must depend on the state she may be in hereafter; possibly blisters near the kidneys may be of service, with small doses of cubebs powder, or extract of colchicum and opium. But of this we must judge by-and-bye.

But disorders of the kidney are much more common as a *consequence* of disease of some other part of the urinary organs. Whatever circumstances cause any obstruction to the passage of urine for a considerable time, will ultimately cause organic changes in the kidney, whether stone, or diseased prostate, or stricture, or whatever the nature of the difficulty may be.

[Mr. Hawkins then described the usual course of such diseases, which were seen in several preparations on the table,—showing inflammation and softening of the kidney—the formation of abscesses—the destruction of the kidney, and its conversion into membranous cysts—the wasting of the organ—with the occasional presence of calculi].

Of the effects of stricture upon the kidney (Mr. Hawkins proceeded), there are two good examples now in the house.

CASE III.—The first of them shows you at present the ordinary symptoms of disorganization of the kidney, when in a quiescent condition. It is the case of John Weighell, æt. 49, admitted as long ago as August last. At the time of his admission this man had suffered from a very bad stricture for twenty years, which would not, at first, admit the smallest catgut bougie; besides which, he had a hard cartilaginous tumour enclosing a cavity in the perineum. Some progress was made in the cure of this, when he was very near dying from sudden increase of the renal disease; since his recovery from which, I have again succeeded in passing instruments through the stricture, though not into the bladder, as the point is obstructed in what appears to be an abscess in the prostate gland, as a good deal of pus is

evacuated separately from and before the urine, the passage of which is occasionally blocked up by the matter.

The symptoms of disease of the kidney are now nearly the same as when he was admitted. In the first place, if you examine the urine, you will find that it contains *albumen*, since it is rendered cloudy and opaque by heat, or by the addition of nitric acid. You are not to conclude, however, from this symptom alone, that the kidney is organically affected, as was at one time imagined, so that the operation for stone would scarcely be performed, if it were present. But if the specific gravity is increased, and there are other symptoms present, then the presence of albumen becomes one means of diagnosis. Secondly, you will find that there is a somewhat *increased* quantity of pale opaline urine, which is highly *alkaline*. It has never been otherwise since I first saw him, although he has taken very considerable doses of nitric and phosphoric acids, with pareira brava and other bitters, combined with opium and hyoseyamus, at different times, since he has been in the hospital. Thirdly, you will find that there is a small proportion of *peculiar mucus* from the kidney. You must distinguish this from theropy semi-purulent secretion that he sometimes has had, which is formed from the bladder in a state of chronic inflammation. What I mean is a powdery matter floating slightly in the water, not so heavy, and not so globular as pus, but not diffused through the urine, or settling at the bottom, like mucus from the bladder ; it is something, as it were, between mucus and albumen in appearance.

These are all the symptoms of renal disease that he has just at present ; but you will recollect that he has at different times complained of pain in the loins and sides of the abdomen, *i.e.* in the course of the ureters. This pain has been slight, however, and has always been relieved by a blister, which he has had several times.

It is singular that very considerable renal disease should frequently produce so little pain ; sometimes, however, it is more severe, and requires cupping,—cautiously, however, in a weak constitution like this man's ; sometimes a seton, or an issue, is advisable, when the pain is constant ; or the occasional use of tartar emetic ointment. Sometimes, again, in the condition of kidney which is now before you, small doses of Chios turpentine, or cubebs, or tincture of cantharides, are of service.

But further : you have seen Weighell very nearly dying of a sudden increase of renal disease, to a return of which he is still liable at any time. It was in January last that he became low-spirited and out of health ; then he had occasional rigors, pain in the back and groins, with more difficulty in making water ; then in a few days he had a great quantity of blood in the water, which came suddenly, and continued for two or three days ; and before it ceased, there came away with the urine a very large quantity of

pus, which continued for some little time, and then ceased. While he was at the worst, he lay in a state of listless half stupor, with a quick, feeble, intermitting pulse, and the brown tongue of typhus fever; and he had occasional delirium, and was frequently crying from extreme depression of mind, when not asleep and stupid. These symptoms continued, more or less, for nearly a month, when he began to revive and recover strength; and the symptoms I have mentioned, both local and constitutional, and as connected with the urine, gradually went away, and left him as you now see him.

Now, what I believe to have happened during this time, was the formation and bursting of an abscess in one kidney, and that probably the right, from an affection of respiration, with pain on that side, which he laboured under for a few days. The discharge of pus from the kidney occurs in three different states—first a quantity is secreted from the tubular structure of the kidney, and from the infundibula and pelvis, without any cavity like that of an abscess, and while the cortical substance is only inflamed. I have seen this discharge take place suddenly, and to the amount of many ounces daily; so that it seemed almost impossible that it could have happened from the secretion from a mucous surface only; and yet dissection has shown that it did so. Secondly, you find small quantities of pus partially confined in cysts, consisting of the infundibula and tubes, enlarged and dilated; these cysts communicating with the excretory tubes. Thirdly, you find circumscribed abscesses in the kidney, not communicating with the excretory tubes: even these, however, you can often trace to the commencement of the tubes, where a drop or two of pus, confined by adhesive inflammation, become the origin of larger collections of matter.

I judge that Weighell had a circumscribed abscess, from the rigors, and so on, *preceding* the purulent discharge, and because there was also a large quantity of blood before the pus, as if the wall of an abscess had been ruptured to give exit to its contents. If I am right on this point, the abscess has since probably filled up.

The treatment which was employed consisted, as you saw, of the exhibition of stimulants to the extent required, nitrous æther, aromatic confection, and tincture of hyoscyamus, and small quantities of wine and brandy, occasionally: not ammonia, you observed, however (which is so good a stimulant in general), on account of the alkaline state of the urine, and the great irritation which this produced in the bladder and urethra. He had also a blister to the right side; and when in the state of greatest oppression, almost amounting to coma, I ordered a blister to the nape of the neck, from the effects of which he felt himself that he derived great advantage. It is a very powerful remedy in that curious stupor and coma that sometimes attend abscesses in the kidney, and which are frequently the symptoms from which the patients die. I once thought that this singular state of half-coma

was peculiar to the abscess of the kidney, and might be connected with a collection of urea in the blood, since the same phenomenon is present in cases of suppression of urine, and is caused by cutting the nerves of the kidney. I am induced to believe, however, that it has not this origin, as I have seen it in many cases of abscess from other causes, in quite as marked a degree, and lasting quite as long; and many persons who die of abscess in the kidney have no such symptom. In our present patient, too, the quantities and qualities of the urine were not altered during the presence of the stupor; while our next case presented no such comatose symptoms, although there was nearly a complete suppression of urine. [See *postea*, p. 310].

CASE IV.—Let us now proceed to the next case, which presents an instructive history to you in several other points besides the disease of the kidney, of which he is now nearly dying, and to which I shall confine my observations. John Colston, æt. 44, was admitted into the hospital nearly at the same time as Weighell, in August last. This man had been in St. Thomas's Hospital eleven years ago, with an effusion of urine, which had destroyed half the penis, and had also left a mere cicatrix in the whole length of the scrotum, caused by the sloughing of the urethra to this extent. Yet, notwithstanding such a serious warning, the man entirely neglected himself till he came to the hospital, hardly able to pass a drop of water, and with fistulous openings in the perineum. You will have observed, that after having dilated this long cicatrix, as well as the original stricture beyond, I was at last obliged to make an opening in the perineum; through which it will be better for him to make water, keeping it open by a catheter, than to allow the water to produce a risk of further effusion of urine in the ragged cicatrix, which is the only canal in front of the opening I have made, down to the stricture.

Now as to the renal disease, you will not fail to have contrasted his case with his fellow-sufferer's in this respect—that till very lately the urine has been unchanged; it is even now properly acid; it has never contained any albumen, nor mucus, except that which has been secreted from the bladder; from which latter cause it has sometimes become very readily alkaline on standing for a long time. He presented, therefore, on admission, a much better case for recovery than Weighell, though he now seems in so much more precarious a condition. In fact, till the last four weeks there has been no evidence of renal disease, except once or twice some slight pain in the back, which was each time removed by a blister.

Secondly, you will have noticed the time at which the disease of the kidney showed itself most prominently. It was not during the long time that he had most difficulty in passing water—when the bladder retained half a pint of water after being apparently empty—when it was so vascular as to bleed from the least touch of the catheter against its interior, which was also

so inflamed as to secrete a large quantity of mucus mixed with pus—but it was after all disturbance of the bladder was nearly gone ; because he could make water readily and easily, without any straining, through the opening which I had made. I have before pointed out to your notice this circumstance, and the necessity there is consequently of watching for the least appearance of renal disease at the time the patient begins to be relieved from his stricture or diseased prostate, or stone.

Thirdly, you will have noticed the great pain and tenderness Colston has had in both testes and down the thighs, which takes place sometimes in renal disease ; especially if there are calculi ;—symptoms, however, which have not been presented to you in the other patient, and which, with other symptoms which I will presently mention to you, incline me to think that there is probably a calculus in the kidney ; perhaps in the right, as there has been more pain in the testis of that side. I show you a beautiful specimen of calculi in the kidney, which I took from a patient who died of this disease of the kidney, produced by stricture, with fistulae, the fatal symptoms coming on suddenly, as in Colston ; because it shows you how the calculi are sometimes formed. You often find small calculi in the tubuli, which drop down into the pelvis, and may escape into the bladder, or may be retained till they increase to such a size as this which I present to you, the centre of which distended the pelvis of the kidney, while several irregular projections show the manner in which they occupied as many separate infundibula. The centre seems to consist chiefly of uric acid in the parts where it is exposed, covered by a coating of triple phosphates. Here is another portion, however, distinct from the rest, and occupying a single infundibulum, or triangular cyst, which appears to have been formed in a very different way, as it is hollow, and beautifully crystallized on the inside of the cavity ; so that it would seem to have been crystallized on the interior of the infundibulum, and gradually increased by deposit on the outside ; the first formation being, perhaps (as Dr. Prout has described), in a semi-fluid state, highly impregnated with uric acid ; the calculous matter being deposited almost like the crystallization of a concentrated saline solution.

The urgent symptoms of renal disease first showed themselves, in Colston, after a long-continued attack of a low form of erysipelas, and he has had three distinct seizures during the last four weeks, each of them exactly alike. The symptoms in each have been wholly different from Weighell's. Each time there has been almost a total *suppression* of urine, about *three ounces* only being secreted in twenty-four hours ; while, in the interval of the attack, the quantity has been above *thirty ounces*. The urine is, at the same time, quite black coloured, or of a dark red colour, and contains a good deal of blood dissolved in it ; coagulation is, of course, therefore produced in the water by heat. As the water increases in quantity the blood diminishes,

and the colour becomes natural. This suppression of the secretion of both kidneys does not prove, however, that both of them are in the same condition; because one gland being disorganized or obstructed, the secretion of the other also will become deranged. Each time, along with some feverishness and great debility, he has had, for three or four days, almost incessant vomiting of dark, thick, unhealthy-looking secretions; sometimes exactly like stercoraceous matter in appearance, though destitute of its smell. This symptom has been somewhat alarming even by itself, from the weakness it has caused; each successive attack rendering him less able to struggle against it. Since the last attack, besides mucus from the bladder, there has also been a good deal of dark pus, which, I believe, comes from the kidney with the blood, and not from the bladder, as it formerly did, in union with mucus. This purulent secretion, however, has not come away, as it did in Weighell, in such a manner as to make me believe that there is a considerable abscess in the kidney, but rather that the suppuration has been the consequence of inflammation supervening to the irritation, perhaps, of one or more calculi: of course, however, I do not mean to be quite positive upon such a point; and, be the exact condition what it may, I think very badly of the case.

I have not much to say as to the treatment of the case, which has been, in principle, like that of Weighell. He has required to be supported, and brandy and soda-water agreed well with the sickness. What did him most good, and relieved each attack, was the giving him small doses of calomel and opium, of which he took about one grain and a half of the former, with a quarter of a grain of the latter, every four or six hours, when the symptoms were at the worst; which seemed to quiet them soon, after common remedies had failed. In the use of mercury, however, in this case, you see a material variation from the remedies employed in Weighell's case, which arose from the circumstance of the acid quality of the urine; every one's experience showing, that, when the urine is alkaline, mercury must be very cautiously employed. It does not seem, however, to be so efficacious in this present seizure as before, neither has a blister been of so much service in the interval between the last two attacks, as it was before; and I must use some other form of counter-irritant—tartar emetic ointment, perhaps—when these symptoms again subside.

[Since the lecture was given, Mr. Hawkins left off the calomel, and gave some prussic acid in saline mixture, with ammonia, several times daily; under which the sickness has gone off, and the urine has again become more healthy, but with pus and mucus in it.]

[*Medical Gazette*, vol. xiv., p. 426, June 21st, 1834.]

CLINICAL OBSERVATIONS

ON SOME

DISEASES OF THE KIDNEY WITH STRICTURE; & ON LITHOTOMY.

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1. Stricture and Disease of the Kidney.—2. Effusion of Urine and Disease of the Kidney.
3. Sloughing, with Disease of the Kidney.—4 & 5. Two Cases of Lithotomy.

THE true use, gentlemen, of pathology, is not, as many persons seem inclined to believe, the mere knowledge of the alteration of structure which diseased parts undergo, but the connecting these alterations with the symptoms previously observed, so as to enable us to recognize disease in its early stages, before alteration of structure has commenced, or made much progress. It is in this way only that we can hope to make our pathological observations subservient to the cure of our patient. Now I brought under your notice, a few weeks since, some cases of the obscure and interesting diseases to which the kidney is liable [see the preceding lecture]; and as one of these cases has ended fatally within these few days, we will, if you please, terminate our observations of it by a few remarks upon its final result;—I mean the case of John Weighell, with stricture and disease of the kidney. As far as the kidneys were concerned, there was no change since our former lecture upon this subject: the symptoms continued in the same quiet form, and there was no return of suppuration from these organs; but he became gradually pale, and weak, and emaciated, without pain in the back, or other inconvenience referable to the kidney; and about the 20th of June he became further reduced by diarrhœa, with a good deal of pain in the abdomen, which, however, seemed rather to be general than distinctly in the course of the ureters. This returned at intervals, and he became gradually worn out, and died on the 6th of July, having for a day or two complained of intense pain in his head, and having slept a good deal, but without the tendency to stupor, observed on a former occasion.

During this time his urethral complaints remained nearly in the same state, except that the suppuration from the abscess, which I told you I believed to exist in the prostate gland, was lessened; and that about a fortnight before his death, the cartilaginous tumour in the perineum a little increased again, though not to the same size as on his first admission into the hospital. During this time I occasionally passed a catheter through the stricture; but for the most part his state of health prevented my trying to do so.

Now let us observe the state of the urinary organs. First, you see this cavity situated chiefly in front of the stricture, in the midst of the perineal tumour; it is now, you observe, a small abscess, communicating with the urethra; but during most of the time it was a small dilatation only of the

urethra, and contained a little urine, which could be pressed out of it ; and the suppuration was probably during the time it recently enlarged. This cavity never obstructed the bougies, and could readily be avoided. Next you see the broad and firm stricture, dense and white in appearance, and the urethra, turned and twisted at the part. The stricture was, in fact, more on one side than on the other ; and you will recollect my showing you sometimes that the end of the instrument had to be moved to the left side before it could be made to go round the point of obstruction—a tolerable-sized catheter used, however, of late, to go through the stricture. Next you see the abscess in the prostate gland, a good deal of the back of which has been absorbed, to form the parietes of the cavity ; the abscess may be large enough to contain a table-spoonful of pus, and by its situation in contact with the rectum, may have contributed to the occurrence of the diarrhœa under which he suffered. You see also the opening into the urethra by the side of the verumontanum, in which I told you the point of the catheter was frequently obstructed. Look, in the next place, to the effect upon the bladder of constant straining against the stricture : it is thickened to the extent of above half an inch, and the large fasciculi of muscular fibres project far into the bladder, the mucous membrane, which is dark coloured, vascular and inflamed, being folded into numerous little pouches beneath the network of the inner fibres. Then you observe the ureters, the pelves of the kidneys, and the infundibula, somewhat enlarged, especially the renal pelvis of the left side, and their mucous membrane inflamed. Lastly, you see that kind of alteration of structure in both kidneys which occasioned the symptoms I detailed on a former occasion ; the secreting structure in both being firm and condensed, and of a yellow colour ; and the left kidney, which is nearly of its natural size, more vascular and brittle than the right, which is diminished to half its natural bulk ; and in this part of it, not above a quarter of an inch thick around the dilated infundibula. When speaking to you of this case before, I mentioned the different ways in which pus was secreted in the kidney ; and I said, that in consequence of the quantity of blood which preceded the discharge of pus, I rather suspected that it came from a circumscribed abscess. I have looked, however, into this part, and although indented on the surface, and nearly absorbed, I cannot say I see anything like the remains of an abscess ; so that I conclude the pus must have come away in the more usual manner, by secretion from the mucous surface. You might perhaps think that the quantity was too great for this source, but I have often seen many ounces secreted daily from the kidney, as in this case, without any breach of surface. And as it happens that another interesting case, which has ended fatally this week, shows you this fact in a marked degree, I will next bring it before you.

Pollard Tate, aged 33 years was admitted on Friday, June 27, in this state.

He is a carpenter, of full plethoric habit, and has been subject to stricture, with occasional retention of urine, for the last six years, though he has done nothing for it. On Sunday night, when in bed, he felt a desire to make water, but was unable to do so ; only a little dribbling away, with much straining ; nor has any water come away since, except by drops. On Monday the penis began to swell ; he passed a bad night ; and on Tuesday he had several rigors, the swelling now extending to the scrotum. The swelling went on increasing till Friday, the 27th, when he first applied to a medical man, who sent him to the hospital.

On his admission, the penis and scrotum, the perineum, and lower part of the abdomen, were enormously swelled, and of a vivid red colour : he was in very great pain, with some fever, and the bladder was much distended with water.

Now, I told you, some time ago, when speaking of effusion of urine, that I liked, if possible, to pass a catheter into the bladder, and in making the necessary incisions, to let one of them reach the instrument in the urethra, near the usual seat of the stricture. I found, however, here that the catheter would not at first pass, from the tense state of the parts, and from the quantity of sloughs in which the point was obstructed, even near the end of the penis ; I therefore made several incisions in the scrotum and penis of considerable depth and length, and another in the perineum, down to the usual situation of the effusion ; which last, in fact, gave exit subsequently to some urine, besides that which came through the catheter. I gave him fifty drops of laudanum, and had him placed in a warm bath as soon as the hæmorrhage ceased. Two hours afterwards he was much more comfortable ; the swelling was not above half the size it had been previously ; and after some little difficulty, the catheter now entered the bladder, and drew off the water which distended it.

When you first see such cases as these, you may think, perhaps, if a stricture is so bad, and produces so serious an impediment to the expulsion of the urine, that the urethra actually gives way behind it ; that the introduction of a catheter must be almost impossible ; but in practice you will fortunately find that there is seldom much difficulty ; for the urine having made its way into the cellular structure, the patient is in great measure relieved from his violent pain and straining, and the spasm of the stricture giving way, it admits an instrument with tolerable facility. This man, for instance, bore a catheter of considerable size, so that but little water passed through the sloughy parts. Probably, indeed, in him the stricture actually sloughed away, at that time, nearly the whole length of the urethra having been destroyed, as you saw at the examination.

This case afforded you an admirable example of the effects of incisions in relieving cellular inflammation, in contrast with the case of Irish, which we

considered in the last lecture ; in that case the whole of the integuments of the penis, serotum, and perineum, and even the coats of the testis, were destroyed by simple cellular inflammation, which had lasted only two days, and in which no opportunity was afforded of making incisions till the parts were almost dead, and yet the examination showed us yesterday that the urethra was perfectly healthy, though the case looked so much like effusion of urine, when it was first admitted. In this case, on the other hand, notwithstanding the irritation of extensive infiltration of urine, not a single portion of skin died, because the incisions were made in time to save it.

Four or five days after Tate's admission, I took this little calculus, like a grain of coffee in shape and appearance, from one of the incisions on the penis. I look upon this, from his history, as having probably been the consequence of his stricture, and the immediate cause of the effusion, by having been forced out by the bladder against the stricture, and having become so impacted in the already narrow canal as to block it up completely.

You have watched, I believe, the progress of this case, and saw that it was very favourable for several days, all the sloughs having come away from under the skin of the penis, scrotum, and perineum, the discharge having become healthy, and the sores granulating well ; during which time the catheter was kept in the bladder, and the constitutional treatment consisted merely of some occasional purgatives, with saline mixture and ammonia ; and of moderately good diet, beef-tea, and so on. In fact, as to the effusion of urine, he had nearly recovered from his danger, and might have recovered but for more serious disease : he had, indeed, besides some erysipelas, which commenced on the 1st July ; but this was mild, and confined to the surface of the skin, and scarcely affected his system, and did not in the least interfere with the cleaning of the sores.

In this case, then, no skin mortified ; but, in fact, very extensive destruction, even of the integuments, by effusion of urine, is rapidly recovered from in persons apparently so healthy as this man seemed to be, during the first few days. Indeed, you have only to recollect Irish's case, which I have alluded to, to believe this ; for, although more skin was lost than I have seen even in effusion of urine, yet the surface of the testes and spermatic cords, and the other parts around, were healthy ; and he, too, might have survived, but for the inflammation, almost amounting to gangrene, which we saw in the mucous membrane of the bowels, and which was indicated even on his admission, by commencing aphthous ulcerations in the mouth, and which was ultimately fatal by diarrhœa.

But, notwithstanding the favourable condition of Tate at first, you saw, on the morning of the 3rd of this month, a sudden change in the expression of his countenance, a complete prostration of strength, and a copious perspiration, with coldness of the hands and feet. This alarming condition

continued, and he was scarcely at any time excited by a considerable quantity of wine, and other stimulants, which were given him. On the 6th, our notes still notice the cold clammy sweat, without apparent cause; for the erysipelas, at this time, was scarcely spreading, and was of a better colour, and the local state did not account for it, the wounds being clean, and the skin quite healthy.

To what, then, was this owing? Suppuration somewhere was evident; but where was it? I spoke to you, at one time, of the possibility of the effusion having produced inflammation in the pelvis; but, in general, the inflammation is bounded by the deep fascia of the pelvis, on the outside of which the effusion invariably takes place; he had had no pain about the sacrum, or above the pubes; and this cause did not seem probable: or was there absorption of pus, or other diseased secretions, so as to occasion those secondary abscesses which are but too common in surgical practice? This, on the whole, seemed the most probable supposition; but if so, no local deposit yet made its appearance. On the 6th, indeed, he had slight diarrhoea, and a little tenderness of the abdomen; and on the day of his death pain was complained of in one wrist-joint. He sunk, however, on the 8th July, and the state of the kidneys afforded sufficient ground for his previous condition, though no complaint was made, which could lead to a knowledge of their condition, while he was in the hospital. The bladder was nearly in the same state as Weighell's, much thickened, and reticulated, and inflamed, and contained a good deal of thick bloody urine. The ureters were very much dilated and inflamed, and both of them were twisted and obstructed near the kidney, as you may see, by other preparations in the museum, is often the case in stricture. The pelves of the kidneys, and infundibula, were much more distended than in Weighell; in a high state of inflammation; and the kidneys themselves were coated with thick yellow lymph; and all these parts were on both sides full of a dark, bloody, purulent secretion, quite pulpy in consistence, and which had passed down in great quantity into the bladder. The structure of both organs was inflamed, but not yet condensed or diminished in bulk, as in Weighell. In the right kidney, where most lymph had been deposited, one or two of the infundibula looked like distinct abscesses. Subsequent examination, however, showed that this was not the case, the cavities all communicating with the pelvis of the kidney by continuous mucous surface.

So many ounces of purulent fluid being thus evidently formed by the mucous surface in this case, it is not surprising that we found no abscess in the kidney in Weighell. I hope, too, you attended to the appearance of the secretion, as it is exactly like that which has come away during the several attacks of renal disease that another patient, Colston, has had, though in him not yet fatal; that is to say, there is a quantity of blood with the pus, coming

away, not in small coagula, as it did in some measure in Weighell, but as a sanguineous secretion, without rupture of vessels.

This patient, then, died of renal disease, produced by his neglected stricture, and it shows you the extent to which renal disease may go on without producing complaint; this patient being a remarkably stout healthy looking person, who had never resorted to medical aid till several days after effusion of urine had taken place; and further, you have seen the sudden and fatal aggravation of the renal disease, notwithstanding its previous slow and insidious progress. Such, too, is often the cause of death after the operation of lithotomy, especially in old persons, the stone producing the same disease in the kidney as in this person was occasioned by the stricture; and just in the same way they suddenly sink, after apparently going on well for a few days; such, too, is the condition occasionally, when you think, during its treatment, that you have nearly cured a stricture.

You will take notice, also, that this is one of the dangers to which patients are equally exposed after the new operation of lithotrity, as well as after the old method of extracting stone. In fact, I cannot help believing that the danger following the operation of breaking down stones in the bladder is as much too lightly regarded as those of lithotomy have been exaggerated in the opinions both of medical men and of the public. It is well known that, in this country at least, a great degree of selection has been observed in the cases in which lithotrity has been to any extent performed, while we, on the other hand, are often obliged to perform the operations of lithotomy against our judgment—in unfavourable as well as favourable cases—in those even in which the other operation has been declined. Tables have formerly been published of the result of many cases of lithotrity, whence, without so much selection, it would seem that the mortality has been as high as after lithotomy; and even with all the present improvements in the method employed, so many fatal cases have occurred, even in the most experienced hands, that I much doubt whether, in old cases of stone, where there is any suspicion of disease of the kidney, or other serious disorganization, it would not be less dangerous to have the operation of lithotomy performed than that of lithotrity. I am not alluding to a case which you saw last year in this hospital, under Baron Heurteloup, because the occurrence of sanguineous apoplexy, which was there fatal, might have occurred after any operation, and did not detract from the value of the operation; but I am alluding to several other well-known cases. Nor, in fact, is it at all surprising that there should be sometimes considerable irritation, when we consider that the stone itself, or its numerous fragments, remain behind to excite irritation, in addition to that produced by perhaps several successive operations with the instruments. The fact is, that if you take away the two dangers—1st, of disease and disorganization of the bladder and kidneys,

which is equal in the two cases ; and, 2ndly, of large stones by the extraction of which laceration of the soft parts about the neck of the bladder is necessarily occasioned, (but the breaking down of which must also be more or less tedious and hazardous,) then I am satisfied that the operation of lithotomy is by no means so dangerous as is commonly imagined, provided the operation has been so performed as to leave a free and depending wound of the external parts for the urine to escape, and a small wound of the internal parts connected with the prostate.

How trivial the operation is, under these circumstances, you can see, I hope, in two little boys lying in the next beds to one another, on whom I have performed the operation of lithotomy. The first of these, George Stone, a little boy between five and six, admitted on the 4th of last month, had only slight symptoms of stone, though they had commenced before he was a year old. I removed the stone on the 19th of last month, and you saw that he had not even the slightest fever, at least I did not myself observe the least acceleration of pulse. On the 26th, a week afterwards, our notes tell us that some urine began to come through the urethra ; and since the 2nd July, the twelfth or thirteenth day after the operation, not a drop has come through the wound. July 6th, the wound was almost well ; and it would probably have to-day been quite so, but that he is in such spirits as to have rather irritated it, not being able to keep his legs quiet. I may observe, with regard to the stone, that it had very much the appearance of being partly in a cyst, for it could only be felt in sounding by the point of the instrument turned towards the pubes ; and it was quite fixed in this situation during the operation, from which I had to dislodge it, with some little difficulty, by the finger turned quite up above the pubes ; and you can see how peculiar the shape of the stone is, as if this narrow part may have been confined. I do not mean positively to assert that it was so ; but if not, it must have been very tightly held by the contracted bladder, both in sounding and in the extraction.

The other case is also a little boy, of about six (James Elmes), admitted on the 2nd July. As the operation, however, was only performed yesterday, the 10th, I cannot assert that he is in no danger ; but I have no doubt that he will do as well as the other child, having at present not the smallest sign of any bad symptom : indeed he has passed a better night, and seems actually better than before he was operated on. [July 22nd.—Since this lecture was delivered this boy has gone on quite well, and most of the water already passes by the urethra.] Nor is it wonderful (on the supposition that the operation of lithotomy is in *itself* not a dangerous one) that he should actually be in a better condition ; for notwithstanding the difficulty there has been in detecting the stone, his sufferings from it have been very severe, as in addition to the usual pain in the penis and

bladder, and the occasional stoppage of the water while he is making it, he has had so much irritation as to have experienced several attacks of complete retention of urine, which is by no means a common symptom of stone, requiring the use of the catheter. On his admission, what is more usual, he was unable to retain it a moment after the pain came on : indeed it constantly dribbled away, so that I have scarcely seen any of it, in order to examine it. He was in constant suffering, and had prolapsus ani to a great degree, in consequence of the bowels always acting violently when the pain in the bladder was severe.

This boy was in the hospital in May of last year, when I was unable to detect the stone, and, having scarlet fever, he was taken home again ; nor was it perceived either before that time, nor since, although a sound or catheter has often been used by different persons. On sounding him a few days ago, however, the stone was immediately perceived, but you observed, when he was brought into the theatre, that my colleagues could not immediately detect its presence. If you examine the stone, you will perceive the probable reason of this uncertainty ; and why, when it was perceived, although as large as a nutmeg, it seemed much smaller than it really was. This was because it is soft and rough on the outside, from an exterior layer, apparently of triple phosphate of ammonia and magnesia, and because it is very light in proportion to its diameter ; consequently it neither rung when struck, as a firmer stone does, nor appeared so large when poised in the concave side of the sound ; for this stone also, as is often the case in children, was not perceived toward the back of the bladder, but only when the sound was drawn towards the pubes.

You had an opportunity, during the operation, of seeing the curious extent to which intus-susception, or prolapsus of the rectum, may take place, in consequence of the irritation of a stone upon the rectum ; for I have seldom seen so large a descent even in an adult. The boy held his breath most resolutely the moment the external incision was begun, so that the bowel was forced down, and, as you saw, it almost baffled the attempts that my colleague made to reduce it and keep it up, and it required some caution not to wound it, in completing the incision into the membranous part of the urethra ; as it formed, after the reduction, a large tumour within the outlet of the pelvis, which completely filled the space between the sides of the innominata, obliging me to watch for one or two periods, when he was renewing his breath, to be able to push aside the great mass of the rectum, in order to cut with safety. Afterwards, of course, it did not signify, as the finger was then able to depress the bowel out of the way of the knife.

By-the-bye, in speaking of the two operations of lithotomy and breaking down the stone, I had, of course, no choice in either of these two cases ; as, on account of the size of the urethra at this early age, it is not safe to trust

to the temper of any instruments small enough to enter the bladder for the purpose of breaking the stone. In fact, now that the construction of the necessary instruments has been so much simplified as to make them nearly perfect, and to render the operation of breaking infinitely less dangerous than on its first introduction, and comparatively easy of execution by any one, the great thing seems to be to establish some general rule of distinction as to the class of cases in which lithotomy should be performed, or in which the old operation of lithotomy is either necessary or preferable to the other.

As I have alluded to the singular case of Irish, in which so much destruction of parts took place from cellular inflammation, without any effusion of urine, I have placed on the table, for your inspection, the bladder and kidneys. You will see the bladder inflamed, and with projections of mucous membrane slightly ulcerated and covered with sabulous matter, though he does not seem to have made any complaint, at any time, of any vesical malady; and in the kidney you may observe numerous small bodies, like cartilage almost in consistence, and of the size of a pea. The function of the organs was probably not interfered with; at least I cannot connect them with any particular functional derangement in the account given me of his previous condition. As we have been speaking, however, of renal diseases, you may examine their structure, if you please, simply as a fact in pathology.

[*Medical Gazette*, vol. xiv., p. 618, July 26, 1834.]

CLINICAL REMARKS ON LITHOTOMY.

1. Three cases cured by Lithotomy.—2. Case of Stone fatal, from refusal of Operation, with Disease of Kidneys.

Mr. Hawkins has recently had four patients at one time under his care, with stone in the bladder. Three of these were little boys lying in contiguous beds, and all about five or six years old, in whom the lateral operation was performed, and who have now all left the hospital cured. Two of these cases have already been spoken of [see the preceding lecture], and got well without anything remarkable; the third was operated on July 31st; but this boy required some care after the operation, as the water did not pass away very readily by the wound; the consequence of which was that he was restless the night after the operation, and even had a slight rigor the following morning. To relieve this a catheter was kept in the wound the greater part of the succeeding eight or ten days, as, whenever it was taken out for a short time, on account of a little irritation in the bladder, a partial retention of urine in the bladder took place. When the catheter was finally removed, however, the sides of the wound immediately united, and all the water passed by the urethra two days afterwards, and he was wholly cured in as short a time as either of the others.

The fourth case was unusual in an hospital, as the patient died of the effects of the stone a few days after his admission, without giving an opportunity for operation; the poor boy literally falling a sacrifice to the obstinacy of his father, who had always refused to send his son to any hospital, though he had been repeatedly asked by friends and neighbours to let something be done for the dreadful sufferings the boy endured for several years.

This boy, Robert Bird, aged 14 years, was admitted into the hospital July 30th, presenting a most frightful appearance of emaciation, and suffering from pain, as, while his arms and legs were scarcely anything more than bone and skin, the muscles of the abdomen were of very great size, from constant straining to make water; the exact course and divisions, and almost all the fibres of the muscles, being visible to the eye, and in a state of almost unceasing contraction; and the muscles of the face, being enlarged and strong, were expressive of the agony he endured. This state of things had lasted for four years in an aggravated form; but the stone had no doubt existed for some time before this, as he had long before been observed to have his hands constantly in his pockets, from irritation of the penis and prepuce, which were very much swollen and inflamed at the time of his admission, from the violence with which he pinched and grasped these parts whenever he made water. Two years ago, indeed, his symptoms were relieved for a time by the passage of a small calculus through the urethra, but his sufferings returned again, worse than ever. When admitted, the urine was incessantly dribbling away, so that it was only once or twice during the time he lived that as much as half an ounce could be obtained for the purpose of examination. He had a good deal of tenderness of the lower part of the abdomen, though none in the loins. Lately he had experienced repeated attacks of diarrhoea, which had contributed still further to weaken him. His pulse was quick and weak; the skin dry and harsh; the tongue generally moist, but very red towards the sides and tip, as if from disease of mucous membrane. It was obvious, in short, that if he could not be very quickly relieved from his present condition, he could not support his sufferings much longer. This was attempted to be done by a warm-bath, some castor-oil, laudanum and starch injection, and a mixture with some soda and magnesia and laudanum; together with some spirituous lotion to the inflamed penis; and sounding him was postponed till he was in a little quieter state.

August 1st.—He has been, on the whole, considerably easier; so that (to use his own expression) he was in heaven, compared to what he used to feel; and a little water was collected, which was acid, but mixed with nearly one-third of pure pus, with a very small quantity of mucus.

Mr. Hawkins passed a catheter into the bladder, and found it almost

entirely filled with a large calculus, without containing any water ; and the passage gave such intolerable pain that the instrument was withdrawn without attempting to pass it along the stone, so as to measure its size. Examination by the rectum showed, however, that it was nearly as large as an egg, and that the bladder was quite contracted round it, and a good deal thickened. This examination also gave very great pain.

Mr. Hawkins gave the foregoing account of his examination, and at the same time remarked that the case was one which well deserved attention, as exhibiting the termination of stone in the bladder, when left entirely to itself, a state which was not often seen in young persons. It was very desirable to ascertain, if possible, the condition of the urinary organs ; which could, however, only partially be made out in such cases. There could be little doubt, from the excessive pain excited, not only by the stone but by the gentlest touch of the catheter, or of the finger in the rectum, that there was some ulceration of the neck of the bladder. In the next place, the appearance of the water made it highly probable that there was disease of the kidney ; since the quantity of pus was very great, with very little mucus. A great quantity of pus might, indeed, be secreted by an inflamed bladder, but then it was commonly mixed copiously with the ropy mucus of the same surface ; whereas there was in this boy scarcely any mucus, neither was it probable that so much purulent secretion should come from an ulcerated surface of the bladder ; so that the pus probably came either from the kidney or from a local abscess connected with the bladder. In general, when the kidneys are much altered in structure, and secreting constantly a large quantity of pus, the urine is alkaline ; whereas this boy's was still acid. Still this rule was not uniform, and therefore he would not pretend to say from which source the purulent matter came. In consequence, however, of finding so much pus in the water, he should not continue the alkaline remedies which he had prescribed before he knew what the state of the water was, because an acid condition of urine is most frequently met with in young subjects, and an alkaline medicine serves to relieve irritation of the bladder arising from this cause ; whenever much pus is formed, however, especially if conjoined with mucus, there is reason to apprehend a tendency to phosphatic deposits ; and an alkali, in any quantity, is injurious. In a stone case, in an old person, on this account he would not prescribe alkaline medicine on an uncertainty, as the most probable form of stone would be alkaline. The absence of pain in the back was no argument against the existence of disease of the kidneys, since that disease might easily be masked by the greater suffering arising from the state of the bladder.

His object, Mr. Hawkins said, would be, if possible, to bring him into a state fit for operation, though it seemed very likely that he would sink before an opportunity was afforded for the removal of the stone ; at present,

certainly, any operation must necessarily be fatal. If the pus came from the kidneys, it was most improbable, indeed, that he would survive, even if he was in a much better state than at present; if it came from an abscess about the bladder, he would have somewhat more chance, though in any case but a small one. Mr. Hawkins operated on a case of stone some years ago, in a man who had an abscess of considerable size in the prostate gland, which was relieved by appropriate treatment before the operation; and the cavity in the gland, which was large enough to lose the end of the catheter for some time in it, and draw off a good deal of pus before the point entered the bladder, was pretty well filled up. This man recovered with great difficulty indeed; and Mr. Hawkins had recently seen him quite well. As to the kind of operation, this boy was evidently (like the three others on whom he had recently operated) not a proper case for lithotrity, as it was clear, with a contracted bladder, not holding half an ounce of water, and an ulceration of its coats, or at least a very high state of inflammation, the only possible chance of success was by immediately and at once getting rid of the stone; and this would hold good even if it had been a small stone instead of a very large one.

The temporary relief experienced by the boy did not continue, however; constant recourse to the internal use of opium, and to opium injections, was necessary; he became weaker, and some wine was called for on the 3rd; and late in the evening of the 4th he was attacked somewhat suddenly with partial stupor, such as Mr. Hawkins had spoken of in a recent clinical lecture, in connection with the subject of diseased kidney. The next day, some fulness being apparent in the perineum, a lancet was plunged in deeply, on the chance of finding an abscess in this situation. This fulness, however, was only the consequence of the violence with which he had been accustomed to grasp these parts with his hands. In this state he lay for nearly thirty hours, when death took place, about a week only after his admission.

The bladder, which was thickened, was found closely contracted around a large stone, about three and a half inches long, and one and a half broad, the end of which, near the fundus, was round, while the other end, resting against the prostate, was more pointed, and rough; and all round this end of the stone the inner surface of the bladder was slightly ulcerated, and deprived of its mucous surface, from whence, no doubt, the intolerable pain felt by the boy had arisen, as the rest of the bladder was not much inflamed. The external surface of the stone was evidently phosphatic and porous; and a section, which we saw, exhibited a beautiful appearance of an oval stone, hard and condensed, and composed of numerous layers of lithic acid and lithate of ammonia, with apparently a mulberry nucleus, having a central perforation in which some lithic acid had entered. Around this stone, which was of the size of a large walnut, a great mass of the phosphates had been

deposited ; but it was curious, that while there was a thin layer only around the sides of this stone, the two ends had a great quantity, giving the stone its elongated form, the phosphatic layer at the fundus being nearly half an inch, and that at the apex about an inch in thickness, as if the lateral contraction of the bladder had prevented its accumulation at the sides of the calculus, after the phosphatic diathesis had succeeded the acid formation. The ureter on both sides was very much enlarged, and both kidneys and the infundibula were distended to a very great degree ; and the cortical substance much expanded around these cavities. In the right kidney, the contents of the large membranous bag formed by this dilatation were clear and healthy urine ; while, on the left side, half of the fluid was a thick pus, which a little pressure on the kidney made to flow through the bladder and urethra. It is remarkable, too, that in the cellular texture around the left kidney, some recent purulent lymph had been deposited, perhaps about the time the stupor came on ; and one little piece of lymph, of the same kind, was also found in the peritoneum, without any sign of general inflammation.

[*Medical Gazette*, vol. xiv., p. 824, Sept. 6, 1834.]

CLINICAL REMARKS

ON A

CASE OF BOUGIE FIXED IN URETHRA,

June 16th, 1846.

I PROPOSE to bring under your notice a case of an unusual injury inflicted by the patient himself. William Danby, 62 years of age, was admitted on the 7th of this month with this account. Last week he had an attack of retention of urine, and was attended by Dr. Willis, who, after having introduced a catheter for him, gave him part of a bougie to pass for himself for a stricture in the front part of the urethra. This portion he by some accident pushed into the urethra, and was unable to remove it ; but with the exception of some pain he made water very well, and when admitted last night a No. 3 catheter was passed by Mr. Spitta with ease into the bladder, and some urine was drawn off ; but while making water this morning it came out itself, and proved to be a portion of a common bougie, about four inches long. He has a stricture about two inches from the glans, and has had it for the last year and a half, with occasional retention, and he is also continually passing phosphatic calculi, and has been so for the same time. The penis and scrotum are a good deal swollen, and have been so for the last ten days, and became suddenly swelled while making a great effort to pass his water. The urine is highly alkaline, and contains some pus.

I have several times known catheters broken off in the urethra, and recede into the bladder, where they have required an operation for their removal, being of course encrusted over by phosphatic deposit, but I do not remember to have seen a bougie pushed by the patient into a false passage in the urethra, as I suppose this must have been, from the odd circumstance of the catheter passing by its side without detecting it. The opening, however, if there be one, may heal again; the swelling of the scrotum, and perhaps that of the penis, having taken place before the bougie was used.

The next day there was still a good deal of œdema and pain about the serotum; but he made water easily. On the 10th an abscess that had formed on the upper part of the right side of the scrotum was opened by Mr. Spitta, which contained nearly two ounces of dark, putrid pus, but was not found to communicate with the urethra, and I was obliged to enlarge the opening the next day, and the surface of the abscess was sloughy. It is said in the note that urine to all appearance passes by the aperture, but the patient denies having seen any water come through, and the probe failed to pass into the urethra. Yesterday (the 15th) urine was found to pass through a small sloughy opening into the urethra, just in front of the scrotum; the abscess in the scrotum was contracting, and this will probably soon heal up.

But the new abscess is of much more serious importance, and it moreover communicates by a large orifice with the urethra, as the man says the whole of the water passed out of it yesterday. A fistulous opening into the urethra in front of the scrotum is always difficult to heal, and you must always avoid it whenever it is possible. A fistula coming through the perineum, or through the serotum, has a sufficient thickness of cellular tissue between the skin and the urethra to heal up readily, and all that is commonly required for the new openings to heal, is to enable the urine to pass more readily through the natural passage; but it is not so in the other situation: there it has a much greater chance of cicatrizing, so as to unite the mucous membrane to the skin, and leave the orifice permanently open. If, therefore, calculi are passing through the urethra and lodge in front of the scrotum, you should always endeavour to draw them forwards to the orifice, a little enlargement of which may enable them to come out; or if you cannot bring them forwards, you should try to pass them backwards, so as to cut on them in the perineum behind the scrotum. You will endeavour to get these fistulæ to heal by keeping a catheter in the bladder, through which all the water may pass, while you prevent cicatrization by the application of caustic, or the actual cautery, so that a granulating surface may be kept up till the edges of the skin come together and unite. I thus succeeded, on one occasion, in healing a small opening an inch behind the glans, through which a calculus had made its way by ulceration; and on another occasion, when an opening had been made by a boy tying a piece of string round the penis

which is not an uncommon trick. But such attempts to heal a fistula on the urethra not unfrequently fail. A boy, about ten years old, was recently sent to me by an old pupil at the hospital, in whom a fistulous opening had been formed, about half way between the scrotum and the glans, by a string tied round and left on eleven weeks before it was discovered; there was a very bad stricture thus formed, which had been two years and a half under treatment, but without any benefit. If the application of caustic, or the actual cautery, fail to keep the orifice raw, so that the granulations may close the orifice, a Taliacotian operation may be tried, though the passage of a little of the urine through the urethra by the side of a catheter makes it difficult to procure union of the new surfaces. A modification of the operation has lately been proposed by Dieffenbach, which consists of not turning a flap of skin round, or bringing the edges of the skin together, but of separating two little lateral flaps of skin sufficiently from the penis at the sides of the fistulous opening, for a larger part of the raw surfaces to be kept in contact; a broader surface for adhesion being thus obtained than when the edges alone touch one another. A case treated by Mr. Le Gros Clark in this country is said by him to have thus succeeded, whereas the difficulty of the old operation will be apparent to you from its having been proposed (and I think practised also) that an opening should be made in the perineum, and the whole of the urine obliged to pass for a time through this opening; no drop of water thus irritates the raw surface of the anterior opening, and as soon as it is perfectly healed no difficulty is experienced in healing the posterior one. Fortunately a fistula in this part is not very common.

[The patient left the hospital, shortly after this time, with half the urine passing through the fistula, the abscess in the scrotum being healed; some phosphatic calculous matter having once or twice come through the opening, it was thought better not to do much to the opening for a short time, and the patient wished to go home.]

[*Medical Gazette*, vol. iii., new series, p. 221.]

CLINICAL LECTURE ON ANEURISM.

Given at St. George's Hospital, May 25th, 1847.

Inguinal Aneurism — Ligature of External Iliac Artery — Delirium — Secondary Hæmorrhage — Cure.

GENTLEMEN,—I propose to-day to draw your attention to a very interesting case which has been a long time under your observation, the consideration of which I have purposely deferred, in order that the case might come near to its termination. I allude to a patient named James Roberts, in whom I tied the external iliac artery a long time ago. He was admitted on January 5th

of the present year, with the following history:—Six months since he was run over by a carriage, which caused a wound of the leg and foot. This had nothing to do, however, with the disease for which he was now admitted. Soon after leaving the hospital he felt *pulsation* at the upper part of the left thigh, unattended with *pain*. About two months since (about four months, that is, after he first noticed the pulsation) he observed for the first time an enlargement, but as there was no pain he continued to work as usual up to five days previous to his admission: the pain then became so severe as to oblige him to lay up. When admitted he had a large pulsating tumour, apparently commencing high up in the femoral artery, probably at the lower part of the common femoral, or just at the division into the superficial and deep vessels. The tumour, when first seen by me several weeks before his admission, was distinctly aneurismal, flat, and about 3 or 3½ inches in diameter, pulsating strongly, and quite soft, as if without coagulum; it extended a little to the outside of the line of the artery, but chiefly to the inside, leaving a small space free below Ponpart's ligament. I endeavoured to persuade him to have the operation performed, but he repeatedly refused to come into the hospital. It underwent sudden increase of size, with great pain, five days before his admission, and within the last thirty-six hours had much increased, especially upwards. Observe here the order in which the symptoms followed one another, for they do not invariably occur thus. First, you see pulsation was noticed, not attended by pain; then a tumour appeared; and lastly pain came on, as if, when the tumour had become much distended, it had produced pain by its pressure on the nerves.

On admission it was very prominent for a considerable space, and altogether was about five inches in each direction, being felt within the pelvis for about an inch above Poupart's ligament, and it contained a little solid coagulum. The pain was very great, so that he had not slept for three nights, and his tongue was white, and the pulse quick.

The pain in these cases varies, and depends in some measure upon the situation of the tumour. Aneurism of this part of the thigh may be in the common femoral artery below the origin of the epigastric and circumflex ilii arteries, or it may involve these vessels, or it may commence lower down at the point where the deep femoral vessel is given off from the common trunk, or in the superficial femoral below this point; and its situation in one or other of these parts materially influences the supply of blood capable of being sent to the part below, after an operation has been performed, and affects also the chances of success of such operation, as the blood passes more or less freely into the aneurismal sac. The tumour in this case appears to have commenced about the division of the trunk into its superficial and deep branches, and as the disease proceeded, it finally, as you have seen, ascended till it passed upwards under Ponpart's ligament.

The sudden increase of size which the swelling underwent is a circumstance not unfrequently observed. You would expect a rapid enlargement to take place sometimes if the disease were a true aneurism, when the inner coats of the artery, having been distended to the greatest extent of which they are capable, at last burst suddenly, and thus formed a false one. But it is more common (at a later period however), when a circumscribed aneurism having gained, as it were, all the cellular tissue in its neighbourhood, to form its coats, can dilate no more, and bursting, becomes diffused. In illustration of this you may remember a case which was in the hospital about a year and a half ago, under my care, where a very sudden increase took place in an aneurism in the ham, so that the tumour on the patient's admittance into the hospital, extended half way down the calf and some way up the thigh, and nearly round the knee. I tried pressure, but it was not well borne, and the rapid increase of the tumour obliged me to tie the artery without delay, by which the disease was cured, and the large tumour nearly absorbed, when he left the house. If the enlargement be very rapid, gangrene of the limb (if the aneurism be seated in an extremity) may take place on account of the collateral circulation being interfered with by this diffusion. Such an occurrence took place in the patient from whom this preparation of popliteal aneurism was taken, and he was obliged in consequence to lose his leg. The account given in the catalogue of the museum is, "enormous aneurism of the thigh; the artery and vein may be seen lying on the tibial side of the tumour, and the popliteal nerve close to the incision (made in the centre of the posterior aspect to show its structure) between it and the blood-vessels. At the time of the operation the nature of the disease was not certainly known, but the limb was removed by Mr. Keate, as mortification was beginning in the toes from the pressure of the aneurism on the vessels. The tumour was by some supposed to be of a malignant nature, as it was quite firm and presented no pulsation, except where the artery passed over its surface." This preparation illustrates the two circumstances of the supervention of gangrene below the disease, and of the complete change which may take place in the appearance of the tumour. You may see that it is almost entirely made up of a large mass of solid coagulum, diffused without a regular sac, and without, as you have heard, any positive indication of the nature of the swelling.

The next remark I will make is respecting the great increase of pain which, in these cases, is often most intense, and sometimes gives rise to so much constitutional disturbance, that you might be led to suppose that the patient was suffering from an attack of fever: but you must distinguish between the two conditions, as the existence of constitutional disturbance arising from pain is no reason why the operation should not be performed. In the first case of aneurism on which I operated, a femoral aneurism, the patient

suffered extreme pain, so that he hardly slept at all for three weeks before his admittance, and he had a pulse of 120, with frequent rigors; but believing that these symptoms were from pain, and not from fever, I tied the artery, which was enlarged for some distance above the tumour. After the artery was tied, the patient declared he was "in heaven," compared with his condition beforehand, and slept as he had not done for full three weeks preceding the operation. The poor fellow died five years afterwards of aneurism of the arch of the aorta. If actual fever be present, however, the operation must not be performed.

Here, then, was an aneurismal tumour, increasing suddenly and to a great extent, and by the pain attending it producing much constitutional disturbance; a case not permitting any delay, and I accordingly operated upon him directly. Our notes tell us, "the operation was performed about an hour after his admission. The usual curved incision about four inches long was made through the parietes of the abdomen and the vessel easily exposed, and an aneurism needle was passed readily around it, as it seemed, without force." I made the incision through the abdominal parietes in the manner recommended by Sir Astley Cooper in preference to the one directed by Mr. Abernethy, as the former puts it in your power to enlarge the wound, by extending your incision at the outer end, a proceeding which may be necessary if the artery cannot be tied low down; and when modified it allows you, if it should be necessary, to tie even the common iliac artery, an operation which has been performed with success. "At the moment of the point of the needle coming through the sheath at the outside," the notes go on to say, "arterial blood was seen to come out in a stream from within the sheath; an artery of some size lay on the sheath, passing down to it apparently from the epigastrie, and ran upwards as far as the iliac artery was seen; but the blood did not come in a jet, as if from any vessel, but in a continual flow such as might be expected if the sheath was raised from the artery by a prolongation of the aneurismal sac, through which the course of the needle would run. After some examination the ligature was left double, and the pulsation in the tumour being apparently quite stopped when the ligatures were each drawn upwards on the finger, they were tied as far apart from each other as they would allow. The bleeding seemed by this to be stopped. On further examination, however, it seemed that there was still some, though much diminished, pulsation in the aneurism; and therefore another ligature was carried round the iliac artery an inch and a half higher up, and as the artery was dilated to nearly twice its usual size, much of the sheath (with the artery lying on it) was tied by the single silk, which gave more pain than before, and quite stopped the aneurismal pulse."

It is rather a startling occurrence to have arterial blood coming out in a full stream during an operation upon any of the large arteries, and it made

myself and colleagues naturally anxious to discover the cause. Bleeding may come from the artery under operation, if its coats are rendered easily lacerable and thin by disease, and should happen to yield while the needle is being passed around the vessel. This could not have been the case in our patient, I believe, as I did not use an amount of force in passing the needle sufficient to have ruptured the coats, unless they were very fragile indeed. Again, if an arterial branch coming off within the sheath should happen to be wounded just at its origin, it would bleed nearly in the same manner that the parent artery itself would if it were wounded there. There was, as I have said, an artery running superficially on the sheath; the bleeding did not come from that, however, and it was not likely that another branch was given off so close. I cannot in any way satisfactorily account for the hæmorrhage, but the most probable explanation is that the aneurism sent a prolongation up the back of the sheath, and that the opening this above where any tumour was visible, gave rise to the bleeding.

It was in consequence of this hæmorrhage that I tied the artery both above and below the point from which it appeared to come, both in case there should be a tear in the coats or a wounded branch, and to render the artery secure from ulceration; as, if separated much from its connections, it would have been unsafe to have put only one ligature at the centre of the part where insulated by the blood of the aneurism and by the operation. The ligatures being secured you saw there was still "some pulsation" remaining in the aneurism. This again was a circumstance we could not satisfactorily account for. Was there a double vessel, as in a case related by Mr. Shaw where there were two superficial femoral arteries in one sheath? Unless this was the case, the only way of accounting for it is by supposing that the pulsation depended upon the influx of blood by means of the collateral vessels, which was not very likely, as the pulsation was stopped by the single ligature I afterwards applied higher up. Altogether it seemed very obscure both to my colleagues and myself. Continuing the notes, we find "a small piece of oiled lint was placed along with the ligatures between the parietes, which were brought together elsewhere by several sutures, and the wound dressed with plaster in the intervals." The dressing the wound in with lint, is a proceeding which I have always adopted in aneurism in order to prevent any confinement of matter, from which I have seen much mischief, when this precaution has not been taken, and the lint may be taken out a day or two after, when suppuration is beginning. In this particular operation also sutures should be employed in sufficient number and depth effectually to secure the abdominal parietes and prevent the formation of hernia, by union of the skin with separation of the cut surfaces of the muscles below. Further on we find, "about two hours after the operation a fit of coughing made a small quantity of blood ooze out of the wound

under the dressings, but it did not return, nor did it feel as if much were in the iliac fossa. Both feet being cold, a hot bottle was applied, and the limb enclosed in wadding and flannel, by which the warmth was soon restored. The pain existing previous to the operation was quite removed." The man, you see, was in a low state from exhaustion before the operation as well as from the operation itself, and the temperature in both extremities was consequently lessened; and not only in that in which the main artery had been tied. At first he did very well.

On the 6th, we find, "A good night was passed with quiet sleep after two doses of *Liq. Opii. Sedativus*." In the afternoon, "Pulse 108, soft—abdomen free from tenderness, but flatulence rather complained of." At 9 P.M. of same day "says he feels restless, and there is tenderness of the abdomen on the left side near the wound. Pulse 108, full and soft. Tongue rather dry. Countenance calm. No feverish heat," so that the tenderness probably depended upon the flatulence.

Next day, "Says he is comfortable, and has no pain in the abdomen. Pulse 116, full. Tongue rather dry. Slept at intervals during the night. No anxiety of countenance."

But on the 8th (the operation having been performed on the 5th), you will observe, a fresh set of symptoms made their appearance. "Some redness showed itself around the wound, and the abdomen became slightly tympanitic." On the following day, "one suture and the dressings were removed yesterday. The redness continuing with some slight induration, the remaining sutures were this day taken out. There has been some pain and restlessness during the night. He has had no sleep. Bowels are confined. Tongue moist. Pulse 100. Abdomen tympanitic. Yellow tinge of sclerotic;" and on the evening of the same day we find, "bowels acted three times from half an ounce of castor oil taken in the afternoon. There has been much delirium since six o'clock."

On the 10th, "Restless night, with no sleep. Delirium continues and has increased. Constant attempts to get out of bed. The wound gaping, with much offensive discharge." At 10 o'clock A.M. of same day, "The delirium has much increased. Abdomen tympanitic with no tenderness. Feet extremely cold. No anxiety of countenance, though much hurry, and his answers are given at random." At 2 P.M. "Still much delirium." At 4 P.M. "Has had some sleep."

Here, then, for two days and a half, our patient had been suffering an attack of delirium and of inflammation of acute character in the cellular tissue around the wound. What was done for him was to administer repeated large doses of opium, and to allow him a certain quantity of gin, to the use of which he had been accustomed before he came into the hospital.

Under this treatment we consequently find on the 11th, "Has passed a good night. Delirium gone, abdomen less tympanitic, almost of natural elevation. Bowels not open. Pulse 96, soft." At 2 P.M. "Tongue coated with a yellowish fur, but more moist. Having taken *seven* grains of opium, in the fourteen hours from 10 P.M. on the 9th to 2 P.M. yesterday the 10th, five good hours' sleep were obtained before he was awakened to take food." This it was necessary to do, as his respiration was getting exceedingly slow, only thirteen inspirations being taken in a minute, and of course it is not right to let a patient sleep too long after taking such large doses of a narcotic drug, lest it might become impossible to rouse him. He continued all night under the influence of the opium, was not this morning at all drowsy, and awoke calm and perfectly rational. He has taken four oz. of gin, with milk and arrowroot, but cannot take becf-tea. To continue four oz. of gin, &c." The furious nature of the delirium which you saw here probably depended upon the very intemperate habits of the patient. He fortunately did not break through the attachments of the wound, or loosen the ligatures of the vessels so as to bring on secondary hæmorrhage, notwithstanding his violence and constant movements. The delirium being thus stopped, this portion of the case now went on very well, the wound contracting and its edges becoming approximated. I find in the notes for the 11th, "The redness of the skin, with subjacent hardness of the cellular tissue of the left side, is less extensive, and the secretion of pus is much more copious and more healthy, coming deeply from the wound and from under the skin of the abdomen above the wound to the distance of two or three inches when opened by the director, and for an inch below the lower edge of the wound, quite to the prominence of the aneurism; some thin sloughs having separated, healthy granulations are now seen from the muscles. About half an inch of skin, chiefly in parts of the upper lip of the wound, has sloughed. Aneurism smaller, and the centre is harder than yesterday. Temperature of limb good."

On the 12th, "Less redness. Abdomen natural, no tympanitis."

On the 15th, "Has passed a good night. Redness has nearly gone. Very little discharge; a portion of cellular tissue has sloughed, and large prominent granulations are visible. Edges of wound slightly approximated; sac small and solid."

In an operation on the external iliac artery there is more danger from inflammation, sloughing and suppuration, than in operations upon arteries in general, on account of the large quantity of loose cellular tissue in the immediate vicinity of that vessel. The peritoneum also would, at first sight, appear very likely to become inflamed from its contiguity to the wounded structures. This does sometimes happen, but not nearly so often as you would expect; and it is curious that in one case perhaps where this membrane

has been uninjured during the operation, it may happen to become affected by inflammation afterwards, while in another, where it may have been wounded, it may be found healthy, and the wound in it healed.

The occurrence of foul suppuration in a case of this nature may also prove fatal, as it did in the case where Mr. Keate tied the external iliac artery last summer, under your observation: of course there is also another danger, namely, that the patient may perish from the absorption of pus and the consequent formation of secondary abscesses, as was the case with the patient from whom this preparation was taken. He died, the catalogue tells us, "fifteen days after the operation, of pneumonia and secondary deposits in the kidneys."

Our patient Roberts fortunately escaped all these dangers, and the sloughs came away even from between the aneurism and the skin luckily without opening its sac, notwithstanding the muscular exertions he made during his delirium. Nothing particular occurred (the case going on well) until the 22nd—seventeen days, that is, after the operation, and about the time when you would expect the ligatures on the artery to separate. The time at which this takes place varies according to the size of the artery, and according to the state of health of the patient, being later with a large artery than with a small one, and earlier if the vessel be diseased or the patient in a bad state of health. About fifteen days is the time you would expect the ligature to come away from an artery of the size now under consideration.

If the process of separation goes on healthily, the ligature gradually cuts its way through the vessel; lymph is effused round the spot where the ligature is applied, and coagula form in the vessel on each side of that spot; these coagula with the lymph effectually close the orifices of the divided artery, and prevent any secondary hæmorrhage taking place when the ligature comes away. But if the artery be unhealthy, these processes take place but imperfectly, and bleeding is liable to occur from the ends of the vessel being only partially closed.

On the 22nd, then, the notes say, "slight arterial hæmorrhage took place while dressing the wound." On the following day there was slight bleeding in the evening.

On the 24th, we read, "house-surgeon called up for bleeding in the night, and some styptic dropped in: blood lost about two oz. Now (2.30 P.M.) there is a small coagulum in the wound, which has united except where the ligatures are, but the granulations and edges of the skin are dark and unhealthy looking, with soft prominent granulations from which perhaps the bleeding comes. Pulse ninety-two. Much pulsation in the aorta in the abdomen, visible on the surface. Tumour smaller and quite hard." There was some Italian styptic applied, which did not probably do much, as on the first occasion the bleeding stopped before it was used. With regard to the

source of the hæmorrhage, subsequent events proved that it arose from the separation of the ligatures, but granulations will sometimes bleed very freely, and two ounces, which was the greatest quantity of blood here lost at one time, is not at all too much to come from such a source; particularly as they were, as the notes inform us, soft and prominent. The nervous state of the patient, evidenced by the pulsation of the aorta, would have tended to rupture the delicate blood vessels of the granulations.

On the 25th, "there was some hæmorrhage this morning, but not considerable. Very slight hæmorrhage on the 26th also."

On the 27th, "no more hæmorrhage; two ligatures, with the coagulum which remained in the wound, have been removed." The ligatures probably having separated on the 23rd, when the bleeding began.

On the 29th, 4 A.M. "some hæmorrhage, several ounces more than before, easily checked by the styptic." 1.30 P.M. "more bleeding, very slight, easily stopped by the same means. Some ice applied to the part, and gallie acid administered internally."

February 1st, "no recurrence of hæmorrhage. Last ligature removed. Aneurism diminished considerably," so that now some enlarged glands became perceptible which had before formed part of the tumour.

Here, then, the patient was in considerable danger each time the bleeding recurred. The blood, which was in too great quantity to have come this second time from the granulations, might have come from either the lower or the upper opening of the artery, and it would have been difficult to say from which, but it happily stopped without anything being done. Neither the styptics applied, nor the gallie acid taken, had probably much to do with its cessation; nature, no doubt, did the most.

When secondary hæmorrhage occurs to any great extent, after an operation upon an artery, it may generally be stopped by well-regulated pressure applied carefully over the whole limb, and by graduated compresses applied (when the case admits) to the artery above the aneurism, care being taken not to stop entirely the supply of blood to the parts below. You will see hereafter that the second attack this patient had was controlled by pressure alone.

If in any case bleeding occur in any quantity, and return frequently, in spite of the pressure, the next proceeding is, not to cut down upon, and try to put a ligature on the vessel at the seat of the operation, where it would probably be found unhealthy, and disposed to ulcerate again, but to tie the trunk higher up. In a case of hæmorrhage from a stump, after amputation, where the supply of blood is not great, this will, in most cases, suffice; and it will also be effectual in many cases of secondary hæmorrhage from aneurism; sometimes it will fail.

This preparation from our museum was taken from a case in which tying the artery above was unsuccessful. The patient, named Ryland, a carrier,

was admitted August 1st, 1827, labouring under popliteal aneurism, which had existed about nine months. Sir B. Brodie performed the operation of tying the femoral artery on the 9th of August. On the 23rd the ligature came away, and he appeared to be doing well. On the 6th of September hæmorrhage ensued, without any apparent cause. On the 8th the artery was taken up at a part above where the first ligature was originally applied, and with apparent success, but a month afterwards bleeding occurred from the second wound. Hæmorrhage recurred again and again until the 2nd of November. Mortification of the foot then took place, and he died. On examination, the artery was found ulcerated above where it had been tied, and small specks of bone were here and there to be discovered in its substance.

But what must have been done for our patient had the bleeding continued? A ligature had already been placed upon the external iliac artery: the next vessel higher up was, then, the common iliac. To tie this vessel even in the natural condition of parts is not an easy operation, but after so much inflammation and suppuration, it would probably have been impossible to have reached it without opening the cavity of the peritoneum, in consequence of extensive sloughing and adhesion of the cellular tissue of the abdominal parietes and iliac fossa. Nor was it certain from which opening the blood came—it was, at least, as likely to be from the lower end, and had the hæmorrhage continued, the case would most likely have left us but little resource.

On March 16th, and for a few days before, he complained of slight numbness in the leg. There was on that day no pain, and the sinus was filling up. He had been walking about the ward daily for about a month, and on the 24th he went out, as he could not be persuaded to remain any longer in the house, and I hoped the better air might succeed in restoring his health.

Now a fresh part of the case commences. On April 9th, a fortnight after he went out, he was readmitted, and gave the following account of himself:—“On reaching home on that day he complained of feeling giddy, and of general uneasiness, and he took to his bed, which he has kept ever since. Soon afterwards he had rigors and pain in the right nates, the wound from the operation discharging the same as before, and not in increased quantity. On his admission this morning he had a furred tongue and weak pulse, cold skin, and pale anxious countenance, and very low spirits. There was a large abscess over the right nates (the operation was performed on the left iliac artery), which was punctured, and more than half a porringer of very foetid pus escaped.”

I punctured the swelling first with a grooved needle, in order to ascertain the nature of the fluid, and to see whether it had any connection with the blood-vessel. Pus only flowed, and I afterwards opened it freely. Now the question naturally arises, why did this abscess form here? There was a sinus existing in the opposite groin, and it was just possible that matter might

have been confined there, and have made its way across the bottom of the pelvis through the opposite sciatic notch, and thus come to occupy the situation of this abscess; but the sinus was not large, and there did not appear to be any confinement of its contents, nor did it seem probable that it was a secondary abscess following absorption of pus from the sinus. I cannot with certainty assign the reason, but I think it not improbable that it was altogether unconnected with the wound, and that it occurred from the bad state of the patient's health; and you know that this is a situation especially liable to abscess, when they form from that cause. He at first did well. The notes for the 12th of April, I find, tell us, that "the probe does not pass into the wound so far as before he left the hospital,"—a circumstance which would lessen the chance of the abscess being connected with the sinus.

On the 14th, "There is very little discharge from the abscess." On the 16th, "Purulent discharge is less in quantity, and thicker. Pulsation is perceptible in the femoral artery below the tumour, and close to its lower end. Remains of aneurism very firm and small."

Two days after this we find something more, however. "Hæmorrhage took place last night from the sinus to the amount of two or three ounces: it ceased spontaneously. There had previously been much pain in the part, which was relieved by the loss of blood."

On the next day, "Pulsation may be felt where the aneurism existed."

On the 20th, "A little more blood oozed in the night."

Next day, "Hæmorrhage again took place at 5 A.M., to the amount of half-a-pint (according to the account given by the night nurse). Countenance pale. Pulse weaker."

Here, then was a new feature in the case. The return of pulsation, and recurrence of the hæmorrhage at the same time, being obviously connected, and not allowing us to suppose that the bleeding came from the granulations; besides, it was in too great quantity to come from any source but from the aneurism or an artery. A return of pulsation in an aneurismal tumour, after a ligature has been put upon the artery above it, is an event which sometimes happens, and it may depend upon several causes. It not unfrequently arises from blood finding its way, by a retrograde current, into the sac by means of the collateral arteries after they have enlarged. When it arises from this cause, it soon passes off again under the employment of pressure; and notwithstanding its reappearance, you need not feel much anxiety concerning the ultimate success of the case. But it may arise from another cause. Here is a preparation taken from a man who had a popliteal aneurism, in which the disease returned after having been apparently cured by operation at the time I was a pupil of the hospital. The patient was admitted in 1821, and the account annexed to it is, "Popliteal aneurism from a patient, Buck,

who was admitted under the care of Mr. Gunning, for a large aneurism in the ham. The superficial femoral was tied, and the patient left the hospital. In 1825, he was readmitted under Mr. Jeffreys : pulsation had reappeared in the pouch about six months previously. The choice of having the artery again tied, or having the leg taken off, was given to him. He preferred the latter, and died a few hours after the operation, apparently of fright." Perhaps had the case occurred in these days, and the ether been administered, it might have had a more successful termination. If you examine the preparation, you will perceive that the artery between the aneurism and the ligature is nearly as large as in its natural condition, and, at the same time, one of the anastomotic branches is of large size, and communicates directly with the sac ; so that a return of the tumour took place because the blood entered the tumour directly, instead of in a retrograde manner, as is usually the case. I remember having my finger on an inguinal aneurism which burst while the patient was being brought into the theatre, in whom Sir B. Brodie tied the external iliac artery ; and this case shows a third source of supply of blood to an aneurism. The coats of the aneurism sloughed subsequently, and much hæmorrhage took place, which was ultimately fatal, because the circumflex ilii and epigastric arteries both opened into the sac itself. You will understand, then, that if the blood enters the sac directly by means of considerable vessels, a *renewal* of the disease may take place. This remarkable preparation has the following history connected with it :—"Large aneurism of the superficial femoral, for which a ligature was applied to the external iliac artery by Sir B. Brodie, in May 1839, and the patient died in July 1843, having presented the following peculiarities in the cure of the aneurism. George Bean was admitted into the hospital with a pulsating tumour of the size of a pullet's egg, situated in the left groin, and presenting all the characters of an aneurism. A ligature was applied upon the external iliac, and all pulsation ceased immediately. Everything went on well, and the patient was discharged from the hospital cured three months after the operation. Three months after his discharge, he was readmitted with pulsation (which had then existed about a month) in the tumour. Graduated compresses and a roller were applied over the tumour and round the body and limb. This treatment was continued for about two months, when all pulsation and sound again disappeared. A year afterwards he was again seen, when it was observed that there was a slight recurrence of the pulsation, but without any increase in size. Two months afterwards the tumour was observed to have again become larger, but all pulsation and sound had disappeared. From this time it gradually and steadily increased, and in the course of the ensuing twelve months it grew to the size of the egg of an ostrich, without ever presenting either pulsation or sound of any kind. In January 1843 the

tumour became stationary, and some time afterwards it began to diminish : the decrease in size continued till July of the same year, when the patient died of phthisis."

This case presents you with a curious instance of the recurrence of pulsation in the tumour, and subsequent growth of the aneurism. Its cause is not quite apparent ; but you may see that the main artery has a free communication with the tumour.

Our patient Roberts had no return of the tumour, though there was a return of pulsation and of hæmorrhage ; and the course to be pursued again became the subject of anxious consideration. " Pressure, as much as he could bear, was applied," our notes tell us, " by means of compresses of lint placed in the course of the femoral artery, and a leather splint over them, and the whole limb bandaged from the foot to the hip with a moderate degree of tightness.—Complained of a great deal of pain from the pressure." No further bleeding took place, and he was beginning to recover, when another symptom arose, which is very remarkable, and has continued up to the present time.

On April the 29th he complained of " violent pain in the leg, which had prevented his sleeping." The countenance was anxious, he had no appetite, sweated much, and was very low-spirited.

On May 1st the pain was somewhat less ; but on the 4th our notes say,— " Countenance haggard ; lies in a very drowsy state, and, when roused, speaks in a very languid manner ; sweats a great deal, and had diarrhœa this morning."

On the 5th these symptoms subsided : he became more lively and cheerful, but there was " continued dull aching pain, which was rendered more acute by the least touch, all down the thigh and leg."

On the 7th.—" Was very well yesterday till the afternoon, when he had rigors, followed by sweating. This morning he has sweated much, but has had no more rigors. He is much depressed. There is less pain in the thigh, but he complains of great numbness in it, and of inability to move it," and he has continued in this low state, though improving lately, and able to get out of bed yesterday ; but he looks haggard, and I cannot even yet consider him perfectly safe. The rigors and violent pain, with the high constitutional disturbance, made me suspect that there was inflammation and suppuration going on deeply, and irritating some of the nerves within the pelvis at their roots : thus giving rise to the pain down the limb. But it has lasted too long, and he is too much improved in health, for this to have been the case ; and, had suppuration taken place, the matter would have shown itself before now.

If it be not owing to this, it shows a very bad condition of the nervous system ; and, that this is the case is rendered probable by the nature of the

remedies which have at each relapse roused him from his low and depressed state. He has been, I may say, almost kept alive by increasing the quantity of stimulus allowed him, and he has been taking daily eight ounces of wine and twelve ounces of brandy, and as much eggs and brandy, for some days past, besides bark and the mineral acids.

Such, then, has been the progress of this case, and it has presented many points worthy of attentive consideration, bearing both on the treatment of aneurism generally, and of wounds, especially of those occurring in persons of intemperate habits. He has been for the last few days going on well. There was still some discharge from the groin on the 25th; and on that day the notes are—"Complains of a burning pain in the leg, and it is œdematous, which, he says, is generally the case. The least touch gives him the most acute pain, but the foot feels rather benumbed."

As long as the sinus continues open, I cannot consider him perfectly safe. He will soon leave us, however; and, if he is careful, and lives quietly and temperately, he may find the change beneficial, and I hope he may ultimately recover.

Aug. 14th.—This patient has slowly improved up to the present time, but is not yet quite free from nervous pain in the limb, nor is he yet able to walk with much vigour, and he has required stimulants in the same quantity, to prevent his again becoming dangerously weak.

[*Medical Gazette*, vol. v., new series, p. 317.]

CLINICAL REMARKS

ON

WOUNDS OF ARTERIES AND SECONDARY HÆMORRHAGE.

June 15, 1847.

IN my last lecture I spoke of aneurism, and of secondary hæmorrhage connected with the ulceration of the coats of arteries. The subject of wounded arteries is also an interesting one, and will be perhaps rendered more so by my placing the two subjects together, and I will therefore proceed to make a few remarks bearing more especially on the treatment which they require. In the first place, then, there is in Wellington Ward, a patient, named Emily Burley, æt. 23, who was admitted on June 7th with "a wound of the left hand, extending from the wrist-joint for about an inch on the outside of the ball of the thumb, and produced by a fall upon a bottle which was broken. There was hæmorrhage to a great extent before her admission; on her admission a branch of the superficialis volæ was secured by ligature, and the bleeding stopped." The next day the edges of the wound were brought

together by adhesive plaster, and on the following day she became an out-patient at her own request.

Here, then, was a simple case of great hæmorrhage from a wounded artery, with the bleeding vessel lying exposed in the wound : the hæmorrhage being stopped by tying both orifices of the bleeding vessel in the wound ; and this is undoubtedly the practice proper to be pursued in such cases wherever it is not contra-indicated by some peculiarities. To this rule there are very few exceptions, but still some cases will occasionally occur to which it cannot be applied. Thus it will sometimes happen that a patient will have received a punctured wound, and its course may be such that the surgeon cannot make himself certain what vessel it is that is wounded. I remember a case, which came under my notice many years ago, of a butcher, who had wounded himself with a long pointed knife, the wound being situated obliquely at the upper and outer part of the thigh. There was much hæmorrhage, and it was not easy to say whether the blood came from the superficial femoral artery or from the profunda, or from one of its branches, and the wound inflicted by the knife was so small that it could not be known whether the divided vessel was near to the surface, or several inches below the external wound. To have followed the rule I have above mentioned, would have obliged Mr. Ewbank, whose patient he was, to have made an extensive incision and suppurating wound in order to get at the artery, with the chance of dividing other large branches in doing so. The proceeding he adopted instead was to tie the common femoral artery in the groin, and the operation was followed by a successful result. It is questionable, perhaps, whether it would not have been the better practice to have tied the external iliac artery, as there are a smaller number of branches coming off in the immediate vicinity of the ligature in the latter vessel to interfere with the proper closing of its divided ends. Here, then, is an instance of success following the tying an artery above and at a distance from the wound ; and the case of a punctured wound is sometimes one of the exceptions to the rule of cutting down upon the divided artery at the seat of the injury.

There is a circumstance which is liable to deceive you sometimes in cases of wounded arteries; and which, if unnoticed, may lead to mistake in practice. I allude to the fact of the blood from the lower extremity of a divided artery (and it may occur even with an artery of large magnitude) being occasionally quite venous in its appearance, and flowing in the same continuous manner as blood from a divided vein usually does. If you were not aware of this circumstance, you might be inclined to leave an artery without a ligature where one ought to be placed, and so run the risk of secondary hæmorrhage occurring, or of a false aneurism being formed :—as an instance of this, I will give you the particulars of a case which came under my care some years ago. Two young people in this neighbourhood, in

consequence of some love affair, endeavoured, it was supposed, to commit suicide by taking poison; and the young lady died, as it was said, from taking Eau de Cologne. With the young man, however, who was a French teacher, the attempt was not successful, and, after the lady's funeral, he very ingeniously tried to destroy himself on her grave by opening the veins at the bend of the elbows; this he did in both arms. He was found in the churchyard, having fainted from loss of blood. He was attended to, for about ten days, by a surgeon, hæmorrhage having repeatedly taken place, which was supposed to be venous;—he was then brought to the hospital. Hæmorrhage, trifling in amount, however, occurred on more than one occasion after his admission, and I was assured by my house-surgeon that it was simply venous. Further bleeding, however, occurring, I did not choose to leave the case any longer to itself, notwithstanding the blood being of the same dark colour, and having stopped when I arrived; and I accordingly enlarged the opening. I found a wound in the brachial artery, involving about a third of its circumference, and it was from this that the hæmorrhage had come. I tied the artery above the wound, but seeing that venous-looking blood still flowed, I was obliged to place a ligature below also. The opening was close to the point of bifurcation, so that I was unable to tie the trunk below the aperture; I accordingly next placed a ligature on the ulnar artery. Still blood flowed, and I was compelled to tie the radial also; thus having to tie three distinct arteries before I could put a stop to a bleeding which had been thought to have come from a vein.

The preceding observations bear more especially upon cases in which the wound is recent, and bleeding is going on from it: there is a case of wounded artery in the house, which presents you with a further state of things. Henry James, æt. 28, was admitted on June 7th, into Oxford Ward, with a punctured wound, of about one-third of an inch in extent, and three-quarters of an inch in depth, situated about three inches above the inner condyle of the femur. On admission, there was some arterial hæmorrhage, which was stopped by a compress of lint, and a bandage round the limb. The accident occurred, as he said, from the slipping of a pen-knife which he was sharpening, and which only passed in for a short distance, though he was afterwards found to be in error; and the direction of the wound was such as to make it probable that only some small artery (the anastomotica, or superior articular), was injured. The limb was placed on a ham splint.

On removing the bandage the following day, much blood was found to have been effused in the cellular tissue, both of the inner part of the thigh, and the anterior part of the leg; the compress and bandage stopped the bleeding, and this treatment you will find sufficient in three-fourths of the punctured wounds of small vessels. But in our patient, things did not go on so well, and on the 11th, the notes are—"no pain; effused blood softer,

except a circumscribed hardness about an inch around the wound : a blush of redness on the edges of the wound." The wound you see, putting on rather an unhealthy appearance ; the patient was not strong, and had a tremulous tongue, indicative of habits of drinking. The hardness immediately around the wound arose, no doubt, from the effused blood having become in part absorbed, and leaving the principal coagulum more distinct. On the 12th, we find, "There is a drop or two of pus in the puncture, but the deeper part has united. The circumscribed hardness observed yesterday has become fluid, and pulsates distinctly with the thrill of a false aneurism. It is not painful, and is scarcely larger than yesterday. The limb was bandaged from the toes upwards, and straps of plaster were placed round the limb with leather over them, and a screw tourniquet making moderate pressure upon the swelling."

On the 13th, the notes tell us, "Pressure of tourniquet could only be borne for three hours yesterday. Pressure afterwards made by lint and bandages."

Here, then, was a state of things totally different from what was presented to us on his admission. There was a pulsating tumour, in fact an arterial aneurism, communicating with the wounded vessel, which was probably only a small artery. The wound having healed in the subcutaneous and muscular tissue, any external hæmorrhage at the time of the formation of the aneurism was prevented, and this formation of a circumscribed traumatic aneurism rendered the case very different from the one we were before considering of hæmorrhage in an open wound. You may see by this preparation that even a very small wound in an artery may produce a large aneurism. In the man from whom it was taken a rupture of all the coats of the carotid took place suddenly (an accident producing all the effects of a wound of the vessel without any external wound in the integuments), and there was a great quantity of blood effused over the neck, sternum, and front of the chest. This became in a few days in a great measure absorbed, and only a small pulsating tumour, about the size of a walnut, was left. A few days afterwards, however, this began to increase, and having broken through the cellular tissue and coagula which at first confined it, attained the size you see in the preparation, and proved fatal by pressure on the trachea ; the opening in the artery is, notwithstanding, not larger than the end of a small probe, and might very probably have been cured by tying the carotid artery below it. The question of the practice proper to be pursued in our patient now arises. The treatment of false aneurism is a point upon which there has been much discussion lately, and you will do well to read a paper by Mr. Liston in the *Medico-Chirurgical Transactions* of last year, which discusses this subject in connection especially with a case of wound received in a duel, about which various opinions have been expressed in the journals and newspapers, many surgeons thinking that the rule justly applicable to a recent open wound of

cutting down and tying the artery above and below the wound, was also the proper practice to be pursued for cases in which the wound had healed, and that it was improper to treat a circumscribed traumatic aneurism by the same operation which would be adopted for a common aneurism resulting from disease of the vessel. It is very easy to criticise a case when all the facts are known in consequence of the dissection of the parts, but to me it appears that the operation performed was the right one in the circumstances. There was in this case an aneurism of a different kind from the one in our patient. In James, the wounded artery, whichever it be, must of necessity be a small one, and the tumour can have no connection with the main artery of the limb. Had the wound been situated higher up in the thigh, there might have been some doubt, but occupying the position which it does, there can be no question but that the femoral artery is safe. In Mr. Liston's case, however, it was not certain with what artery the aneurism was connected; the tumour occupied such a situation that no pressure could be made on the main trunk above, and any attempt to reach the wound in the vessel by opening the aneurismal sac might have proved instantly fatal from hæmorrhage. For this reason I think that he was right in tying the iliac artery above, and that it would probably have succeeded but for the accidental occurrence of peritonitis, just as it succeeded in the punctured wound of the thigh under Mr. Ewbank's care. The following case occurred to myself, and seemed to me to be an exception to the rule of tying the artery at the wounded part. Two young men, brothers, were playing, or quarrelling, and one of them received a wound of the forearm, in the course of the ulnar artery, from a butcher's knife, which their business required them to use. I did not see him till some days after the accident, and then there was a swelling in the middle of the forearm the size of an apple, which had been supposed to be an abscess, the puncture being quite healed; I found that it pulsed, however, and was, in fact, a false aneurism. I at first made pressure over it, and the tumour became smaller, and nearly solid, and seemed likely to go away, but then it again began to increase. I did not like to make an opening among the muscles and other tissues infiltrated with blood, as such a wound is almost sure to become unhealthy and foul. I therefore tied the humoral artery at a distance, the sac appearing circumscribed enough to make it exactly like a common aneurism. The proceeding was followed by a perfect cure; and I think that, by adopting it, you in many cases have a very great chance of being successful, while you avoid much risk which attends a foul wound. Pressure, without operation, may effect a cure in many cases if the opening in the artery be small, and the patient be in a good state of health, so that it may produce no constitutional disturbance. It must (as in all cases where general pressure is used) be applied equally from the extremities over every part of the limb below the

tumour, over the tumour itself, and in some degree to the trunk of the artery above, so as to retard, but not necessarily to stop, the current of blood through it. You may recollect a case under Mr. Tatum, about eighteen months ago, of aneurism connected with the ulnar artery, which he treated with perfect success by these means.

I have seen at least seven or eight instances of circumscribed aneurism of the brachial artery at the bend of the elbow, the consequence of a wound inflicted during venesection, and in all of them pressure has been successful. The tumour becomes consolidated, pulsation ceases, and the coagulum becomes absorbed, the vessel being in a few cases pervious, but generally obliterated at the seat of the wound.

Should in any case pressure fail to effect a cure, provided the tumour were not rapidly increasing, from the wound in the vessel being large, or the cyst thin and weak, you may tie the trunk of the artery above. You gain, by doing so, the advantage of having a clean incision in healthy parts to deal with, instead of a ragged wound in tissues infiltrated with serum and coagula, and almost certain to be followed by foul suppuration, with much fever and irritation; and in a great proportion of cases the operation, I believe, will prove successful, assisted by judicious pressure.

These remarks apply to cases where the aneurism is properly circumscribed. If, on the contrary, the covering of the tumour be thin, so that it is not confined, and is therefore increasing rapidly, or if the wound in the artery is large, and the blood issues with such force as to distend the sac quickly, the case remains like one of wounded artery, and is not to be considered as an aneurism at all. In these circumstances it is right to cut down upon the vessel in the cavity of blood, and tie it above and below the wound in its coats, because the hæmorrhage is very likely to go on, and the swelling to increase, even after the main trunk has been tied at a distance from the sac; and a cavity so rapidly filled with blood—that is to say, the blood diffused in the cellular tissue without a proper sac,—is much more likely to suppurate, with the danger of a recurrence of hæmorrhage in consequence of suppuration and ulceration, notwithstanding the temporary closure of the vessel by a ligature applied to the trunk above.

The remarks will guide you in some measure to what will most likely be necessary to be done for our patient. The pressure, as you saw, was not borne: the pulsation, our notes for yesterday inform us, still exists, and the wound is even getting more inflamed.

I to-day removed the bandages and dressings, and found that the wound in the skin was a little ulcerated, and there was more redness around, and I think there is great chance that the opening in the muscle will ulcerate, and be attended with hæmorrhage. At all events, there is much risk of subsequent inflammation and suppuration opening the tumour, and if

pressure to-day does not stop the pulsation, and cause coagulation of the effused blood, I shall to-morrow open the aneurism, and tie the artery. The artery is small, and there will be no chance of dangerous bleeding while doing so; and if the patient were healthy, I should be able to secure it perfectly, and there would be no chance of secondary hæmorrhage; but the same condition of system which has made the wound fester may produce unhealthy ulceration in the coats of the vessel, and give rise to bleeding when the ligatures separate. [See below.]

[*Medical Gazette*, vol. v., new series, p. 405.]

CLINICAL REMARKS,

JUNE 22ND, 1847, ON

1. *False Aneurism in the Thigh.*
 2. *Hæmorrhage with Hospital Gangrene.*
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BEFORE taking you to-day to the consideration of any fresh subject, I will again draw your attention to one or two cases upon which I have already made some observations, and which now present some new points worthy of your notice.

In the first place, you may remember that in my lecture of last week I spoke of two cases of hæmorrhage from wounds of an artery. In one of these cases, that of Henry James, in Oxford Ward, I told you that there was a false aneurism in consequence of a wound of some small artery at the lower and inner part of the thigh, and, from the notes for that day, you heard that the wound of the skin was becoming inflamed, and threatening to ulcerate into the cavity of the aneurism, an event which would of course have been attended with much hæmorrhage. My colleagues saw the case with me on the following day, as I told you I had requested, that being our usual consultation day. On this day, June 16th, the notes are, "No sleep from the pain. Tongue dry and loaded. Heat of skin; slight shivering this morning. Bowels not open. Upon removing the strapping, little if any pulsation was felt. There was tenderness, redness, and swelling of the skin around the wound; the ulceration had spread, and the sac was opened, and some fluid dark blood oozed out." The blood was small in quantity, and seemed to be only the contents of the sac half coagulated, and it at first appeared as if the inflammation had closed the opening in the artery so as to prevent any blood flowing from it, and, therefore, it appeared to us that there was then no necessity for performing the operation I had meditated. The wound was restrapped, and some green dressing applied over it, but in less than an hour after this was done, fresh arterial blood flowed out, and it was evident that the wound

in the artery was not closed, and that the hæmorrhage was fresh from the vessel, and I at once endeavoured to secure it in the way I last week told you of. The notes tell us, "Hæmorrhage having come on, and effusion into the cellular tissue of the thigh increasing, it was determined to open the sac, and tie the artery above and below the wounded part. Accordingly a director was passed into the external wound, and the sac laid open above and below to the extent of three or four inches. Coagula were found blocking up the internal wound, and on removing these a small wound was seen in the vastus internus muscle, which was enlarged." I found it was a very narrow punctured wound, and was situated so deeply that the account given by our patient of its having been done with a pen-knife could not be correct; and, upon questioning him, it turned out to have been a elased knife. The notes go on to say, "After some time, on account of the difficulties occasioned by the coagula and muscular fibres, a ligature was passed under the artery, by which the upper end was secured; the lower end was tied afterwards with the assistance of a tenaculum." This difficulty you will always meet with, when you cut down into a part where blood has been effused for any length of time; the tissues get broken up and altered, and the blood oozing from among this mixture of coagulum, cellular tissue, and muscle, prevents your discovering the bleeding point. You see blood coming apparently from an opening, but upon examining this you find that it comes from beneath, and perhaps from a point at some distance. After the artery was secured all bleeding stopped, the edges being loosely brought together. The artery wounded was quite at the bottom of the puncture in the vastus internus, about two and a half inches from the surface, and it was divided for about two-thirds of its circumference. This is more especially the kind of wound from which secondary hæmorrhage is liable to take place. The state of parts discovered during the operation shows that the practice pursued was better than tying the main artery above, and the case has since gone on very favourably. I should have observed that the operation caused much pain, and I was obliged to administer thirty drops of laudanum immediately, and some Dover's powder in a saline draught every six hours. The next day the tongue was moist, cleaner, but still tremulous; there had been no shivering, and there was less tension around the wound. The notes also inform us that suppuration was commencing in the wound, and that it was filled with a dark brown fluid, probably pus and blood mixed. He has been going on well since. The ligatures separated yesterday without any recurrence of the hæmorrhage; neither has there been any tendency to sloughing or inflammation about the wound; it is granulating healthily, and he seems likely to do well.

Another subject which I wish to bring under your notice, is that of Hospital Gangrene; a description of the various forms of which I gave you

in my second lecture of this course; at a time when some examples of it first appeared in the wards [see *ante*, p. 214]. It has, unfortunately occurred in several instances since, and some of the patients under the care of my colleagues have been in much danger. Of my own immediate patients, one only has been affected to any great extent, a boy named George Williams, in whom some sloughing took place, connected with a scrofulous abscess over the os calcis, and also around a lancet puncture I made just above. Part of the bone was exposed by the ulceration, but in a few days the unhealthy process was stopped by the same treatment which you have seen do very well in the earlier cases, namely, opium and ammonia, with latterly bark internally, and conium and lead lotion locally. He is now doing well.

This case was of the same character as those I before brought before you,—that is to say, it was a case of sloughing phagedæna. But you may remember that I told you that the term hospital gangrene included the form of unhealthy action in which the destructive process took place by sloughing alone without any phagedenic ulceration. An instance of this form of the disease, the only case, I believe, which has occurred here, you have now in a patient in Wellington Ward, in whom, however, the disease did not make its appearance while she was in the hospital.

The patient to whom I refer, Emily Burley, is one of the patients of whom I spoke to you last week, as having had a wound of the superficialis volæ, or of a branch of it, which caused much bleeding, but was quickly stopped, however, by a ligature placed upon the two ends of the artery at the wounded part by the house-surgeon. She went on well, and left the hospital on the second day after the accident, at her own desire. On June 19th, however, ten days after she went out of the house, she was readmitted, and the notes for that day describe her state thus:—

“The forearm and hand œdematous from a compress and tight bandage which had been applied to the brachial artery before her admission, to stop some hæmorrhage from the wound. The hand was red, and there was a large sphacelated mass of the size of a crown-piece, occupying the situation of the old wound, but extending down to the wrist, and back of the hand. Skin around red and tender, and some redness extending up the forearm.

“She was prematurely confined of a six months’ child on the 13th, no unfavourable symptoms having been since present. The wound continued to go on well till the 17th, when the edges were observed to be black and the discharge offensive, and the hand was benumbed. Mortification gradually extended up to the time of her readmission. Bleeding from the wound to the extent of about half-a-pint took place in the morning, a few hours before she came in.”

The textures around the wound were, as you saw, exceedingly soft and puffy, and there was a swelling of the slough as it were, by the infiltration

of scum, and the case presented a very good example of the rapidly spreading gangrenous sore. In the former lecture I drew your attention to the great efficacy of the local application of nitric acid in stopping the unhealthy process in these sores. The cases at that time in the hospital had more of the character of phagedæna, and I believe no case has been severe enough to require the use of the acid. But in Burley it was evident that its immediate application was necessary to stop the rapidly spreading gangrene. I accordingly applied it by means of a stick to the surface of the slough, to the parts beneath, and to the edges of the surrounding skin. It did not produce much pain, but I gave her a dose of laudanum immediately after, and put her upon the use of the haust. cinchonæ and carbonate of ammonia. In applying the acid below the slough it was found that the previous gangrene extended deeply enough to destroy several of the tendons, and that it had also opened the joint of the thumb. On the next day the notes are, "Slept at times during the night, the laudanum having been repeated about 10 P.M. Gangrene not extending. Discharge profuse and sanious. Some can be squeezed from the external border of the forearm for about an inch and a half towards the elbow, in the situation of the redness and tenderness noted yesterday." The cellular tissue was, in fact, dead to that extent. I was obliged freely to lay it open, and found the surface of the radius exposed for some distance. "There was but little pain complained of. Pulse 132, sharp and weak. Tongue clean, rather dry. Bowels open yesterday." The nitric acid had, in short, effectually stopped the sloughing process, and there has been no appearance of ulceration since. There is only one spot to-day, which looks sufficiently dark to make me apprehend a return, though I need not tell you that it *may* recur in any part of the wound, notwithstanding its present healthy appearance. Everything seems going on favourably. She has borne her diet well, consisting of the usual ordinary diet of the hospital, with five ounces of wine, and has expressed a wish for some porter, which I have allowed her to have; she has lost her anxiety of countenance also. Here, then, is the only instance you have had presented to you, of the gangrenous form of hospital gangrene; and in it you have seen the very salutary effects of the strong nitric acid, both as regards the sore in causing the cessation of the sloughing process, and as regards the constitution in the improvement of the health consequent on that cessation; and should the ulcer again take on the same character, recourse must be again had to the same remedy.

With regard to the hæmorrhage which occurred, it is possible that it might have been from the artery which was tied upon the separation of the ligature. I think, however, that it is more probable that its real cause was the opening some small vessels by the sloughing process. You perceive that there has been no return of bleeding, which there probably would have been, after all the disturbance the wound has undergone, had the hæmorrhage proceeded

from the imperfect closure of an artery of any magnitude. The tourniquet, which checked the bleeding before her admission, was directly removed, and has not been employed since; the wound has been left open and exposed, because pressure would have been likely to increase considerably the swelling and inflammation of the gangrenous sore, and the nitric acid has been sufficient to prevent a return of the hæmorrhage by the consolidation its effects in the living tissues of the part. This case shows us that the disposition of wounds and ulcers to take on an unhealthy character still obtains around the metropolis, and that it probably depends upon the same condition of atmosphere which has caused other low forms of disease and fevers of a low type to prevail so extensively. It shows you also another point, namely that the gangrene was not owing to the hospital air, since the wound which was quite healthy when she left us, took on the gangrenous ulceration some days afterwards while she was at her own home.

[*Medical Gazette*, vol. v., new series, p. 489.]

CLINICAL REMARKS

ON

LACERATED WOUNDS WITH HÆMORRHAGE.

June 23rd, 1846.

I WILL next draw your attention to two good examples of lacerated wounds, which came into the hospital nearly on the same day, and which afford a strong contrast in the effects of such wounds on young healthy persons, or on middle-aged or elderly persons, whose constitutions have been altered still further by habits of intemperance and free living. Louisa White, æt. 11, was admitted May 9th, with a lacerated wound, about two inches in length, situated on the inner side of the arm, just above the external condyle of the humerus, which was caused by a spike running into her arm, while she was climbing over some railing, and which exposed the triceps muscle. There was also a note of the ulnar nerve being torn across, which my clinical clerk was informed had been observed, but which was clearly not the case, as the sensation and motion of the little finger were perfect. Two sutures, lint, and a bandage, were applied, and a splint put in front of the arm.

A splint is of great use in wounds about a joint, or where muscles are injured; a bandage and plaster must be very cautiously applied, however, and removed as soon as there is any sign of swelling and tension; and in general it is better to have no bandage at all. With regard to the sutures which were used, there is no objection to their use if the part is not much bruised, provided they are very carefully removed as soon as swelling or redness show themselves; it is better to bring parts which are not likely to unite

somewhat into their proper place, as it facilitates the subsequent healing of the wound, the flaps of which become hardened and fixed in whatever position you first place them, and therefore close in more easily if preserved of their natural figure than if allowed to be turned or altered in shape; but with all lacerated wounds the chief thing to be attended to is to prevent the least confinement of the secretions of the part, not a drop of which is to be allowed to be imprisoned; the wounds must therefore be freely opened by the finger, or a director, the next day, or the second day, according to the rapidity of the inflammation. In this little girl the sutures were left in for two days, and then the wound was freely opened, and you saw that the surface soon became free from sloughs, and healed up, and she left the hospital on the 27th. In fact, in young and healthy individuals, lacerated wounds of great size will do extremely well. But the other patient was not so fortunate, and the case presented one or two points of interest during its progress to which I will draw your attention.

This patient, Ezekiel Warren, who is 63 years old, was admitted on the 7th of May with a large triangular flap wound, about two inches square, situated on the inner and posterior side of the left arm at the lower part of the axilla; the wound laid bare the small head of the triceps, the brachial artery, and ulnar nerve, and I suppose the median nerve also, and a few of the fibres of the coraeo-brachialis muscle. There was also much bruising and ecchymosis of the tissues in front of the wound, which did not bleed much on his admission. There was partial loss of sensation and motion of the fingers of the same hand. He is of a full and drunken habit of body, being tipsy at the time of the accident, which was caused by his falling on a spike at the corner of a street. The arm was confined to the side, and cold lotion applied.

On the 9th it is said that there was a good deal of oedema and puffiness of the arm below the wound, as far as the elbow, with some swelling of the forearm; and the next day, there is increased inflammation of the arm; it is more hard and brawny, and the edges of the wound are sloughy; the discharge is thin, and of a dirty yellow colour; the inflammation extends as high as the shoulder, and as low as the elbow. Now, with cellular inflammation following a lacerated wound, had the wound been a small one it would have been necessary to enlarge it; and had the swelling been tense it would have been necessary to make incisions, in order to check the inflammation and prevent sloughing and gangrene: as it was, however, the finger could be passed freely in every direction, and this proceeding, therefore, was not required; and on the 15th it is noted that the inflammation of the arm had diminished: the lower part of the wound is sloughy, the upper feebly granulating; but it is also observed, that there was some puffiness and fluctuation on the lower part and front of the arm,

and a director being passed through the original wound, it presented itself at this part, and was cut down upon, and some pus which had lodged here was evacuated : the incision was, in fact, on the outside of the biceps, the probe passing between it and the brachialis muscle. The next day the swelling and tension of the arm are said to be much diminished, and a good deal of offensive discharge comes from the wound, which is rather sloughy. There is some fluctuation and puffiness below the wound made yesterday, and a small incision was made on it, which was done by the house-surgeon, near the elbow. The arm then went on well, and on the 20th it is said, there is much less redness and tension of the arm ; granulations of the wound more healthy, but there is a good deal of sloughy discharge from it.

But now we come to a new feature in the case :—On the 21st it is noted, there was some bleeding from the wounds in the night, and this morning, at half-past nine, there was a great deal of bleeding, but the quantity could not be exactly determined ; the bleeding came from both wounds, but principally from the original one. He passed a restless night. Lint, with the pads and bandages, were applied to the arm. This, however, was only a temporary measure, which could not be continued in an inflamed arm without risk of gangrene of the arm, and in secondary hæmorrhage from ulcerated arteries the great thing is always, if possible, to expose the wound thoroughly, and take away the tension from the open vessels ; and accordingly it is said, at a quarter to two, when I saw the patient, that the bandages and lint were removed, which were in part soaked with blood, and the wounds filled with coagula ; and after enlarging the original wound it was found that the hæmorrhage proceeded chiefly from the anterior wound, and that it was of an arterial colour. An incision was then made several inches long, in the upper wound, to determine the point whence the bleeding proceeded, when the whole of the muscles down to the bone and partly round it were found softened and sloughy, and bleeding from all points ; my finger, in fact, touched the bone from the torn condition of the brachial muscle. Pressure was made on the subclavian and axillary arteries, as the bleeding was going on freely, and the two wounds of the arm were connected together by an oblique incision (the intermediate flap being nearly three inches wide), which laid bare, for some few inches, the brachial artery and median nerve, with the inner head of the biceps muscle. On making these incisions, and exposing the wound to the air, with the application of cold, the bleeding was stopped.

When I first examined the arm, and made the first incision, the thought of even removing the arm at the shoulder-joint crossed my mind, from a combination of several circumstances. Here was an extensive sloughy cavity, bleeding largely from apparently many vessels, which might stop as usual if I could lay it open freely ; but after the enlargement of the first

wound, the finger felt the humeral artery exposed for some inches, and coming near from it, and passing into the superficial mass of skin and muscle, was a cord which, to myself and some of my colleagues, appeared to be the ulnar or median nerve insulated, and preventing a transverse incision to expose the bleeding cavity. Now the cutting across a large nerve is a very serious affair, involving the loss of motion and sensation, which may never be recovered, for wounds and operations have been followed by such effects for the whole of a person's life, particularly when there has been any loss of substance or displacement, which must have been the case here;—nor is this all, but whenever a deep or large nerve of sensation has been injured, there is a loss of power of regulating the temperature and supporting the nutrition of the parts below, just as there is in paraplegia from injuries and diseases of the spinal cord when sensation is lost. The arm, therefore, would probably have been an useless inuendure to the man, who would never be able to touch a good conductor of heat, such as a piece of marble or iron, or put his hand into water far below the boiling temperature, without having blisters and sloughing produced, as if he had been scalded. To this was added the risk arising from a large sloughy cavity, liable to repeated attacks of hæmorrhage from ulcerated arteries, and likely to occasion absorption of matter, and secondary abscesses, and fatal irritation. On consultation with my colleagues, however, and renewed examination, there was a doubt whether it was a nerve which was exposed, and of course the least doubt on this matter would prevent the thoughts of amputation. I therefore first cut across the thickness of substance between the two longitudinal wounds above the cord, and on this being exposed, and dissecting it a little downwards into the soft substance of the lower flap, in which it was involved, it became clear that it was a portion of the short head of the biceps coming from the axilla, which I then cut across also, so as entirely to expose the parts; and the trunk of the artery being uninjured, the branches soon ceased to bleed.

There was for the present no return of bleeding, and he went on well till the 25th, when it is noted that he passed a bad night from the tight application of strapping; there was slight pain and redness of the arm, and some confinement of matter between the skin and biceps. Strict injunctions were all along given that nothing at all tight should be applied, but it is difficult to judge how far pressure may be safely applied where different persons make the application, and I have several times had to separate adhesions since that time, lest fresh mischief should ensue, which was not altogether prevented from this first premature reunion of parts, for the next day (the 26th) it is said there is slight pain, but no redness or œdema of the arm; and the following day (the 27th) there has been slight hæmorrhage from some of the granulations, which look fatty, and the discharge is thin; and the 28th, there is still some slight bleeding from the wound, and a large

clot of blood fills the cavity, and the granulations are more unhealthy; and at half-past one, when I saw the patient, there was considerable arterial hæmorrhage, which obliged me to tear apart the several flaps to find its source, and I found it proceeded from an artery situated in the remains of the biceps muscle, ulcerated about half an inch from the main trunk, which I secured with a ligature, and bleeding has not again returned.

On the 31st, however, the notes specify a fresh cause of alarm, for it is said, yesterday evening he had a rigor, and complained of severe pain in the forehead, and had an attack of vomiting; there is some pain and erysipelatous redness of the skin of the arm, as far as the elbow, and the discharge and granulations are unhealthy, and he has passed a bad night, and had a slight cough. This was about the period when secondary deposits were very likely to come on from such a wound as this;—here was just such symptoms as might usher them in, and the cough seemed even to point out the lungs as the probable seat of some inflammation. It proved, however, to be only an attack of slight common erysipelatous inflammation: the next day the notes say he has passed a better night, and has had no return of rigors; the redness and inflammation of the arm have diminished, the discharge from the wound is more healthy, and the wound looks better, and he has now, June 23rd, got nearly safe from return of hæmorrhage and secondary inflammation, with a necessity for great caution, however, even now, that not a drop of purulent secretion is blocked up by granulations, as this immediately threatens swelling and redness.

You see, then, how different such a case as this man's is from the last, and his danger has chiefly arisen, not from the greater size of the wound, but from the intemperate habits and advanced age of the patient. [The man has since left the hospital with the wound nearly healed.]

[*Medical Gazette*, vol. iii., new series, p. 313.]

CLINICAL REMARKS

ON

NECROSIS OF THE FEMUR.

1. *Necrosis of Femur—Abscess of Thigh—Erysipelas—Abscess of Knee-Joint—Amputation.*
2. *Removal of Sequestra—Hæmorrhage—Ligature of Femoral Artery—Amputation.*

THE subject of necrosis is at all times a very curious and interesting one; but when the femur is the situation of it, this disease becomes exceedingly important and dangerous, and presents some points of surgical interest in which it differs from the same disease in other bones; and as I have two

cases of necrosis of the femur at present under my care, I will make them the medium of placing a few observations upon the subject before you. The history of these cases at the time of their admission is as follows :—

1. Frederic Willis, æt 13, admitted December 19th, 1832. One month before his admission he fell down and struck his left knee, which was followed by a good deal of pain, with general swelling of the whole thigh, and some also of the leg and foot; the pain becoming at last exceedingly severe, and being accompanied with much fever. The swelling, at the time of admission, was confined to the lower half or two thirds of the femur, and matter was felt under the vasti muscles, with much tenderness over the abscess, and a good deal of febrile excitement, but without any redness or discoloration of the skin covering it.

2. Jeremiah Chandler, æt. 21, admitted November 21st, 1832. Three years and a half ago he felt acute pain in the knee, which came on suddenly while he was at work; which was followed immediately by much swelling and fever. He was confined to bed three months, and was not able to return to work for two years. The thigh was poulticed, and had emetic tartar ointment applied at first; but an abscess formed, which in two months burst on the inside, and continued to discharge till the time of his admission, when there was an opening leading down to dead bone, which was surrounded by new bone. He did not suffer locally from the disease when admitted, and his health was good.

The history of these two cases, then, is that of acute inflammation of the bone and periosteum, ending in necrosis of the femur; and two different periods of the disease are presented to your notice. In one case, you will observe that the disease arose from an injury to the knee, and in the other it took place spontaneously; but in whatever way the inflammation occurs, whether from a blow or from cold, or without any evident cause, its course is nearly the same, in the same kind of inflammation.

But, in reality, acute inflammation of the periosteum of the long bones occurs in two very different forms: in the first of these the inflammation is of a healthy character; it is accompanied with more or less inflammatory fever, with a good deal of local pain, commencing for the most part about the knee-joint, and the abscess which forms consists of healthy pus, surrounding the bone, the periosteum of which is separated from it along with the muscles which are attached to it. This kind of inflammation you saw in an early stage in Willis; and was, I have no doubt, the character of the inflammation in Chandler also. It commonly terminates favourably, and new bone is readily formed, because the periosteum is not destroyed.

In the other kind of inflammation, on the contrary, the abscess is of a different character; the pus is in smaller quantity, and is mixed with shreds of dead periosteum and cellular membrane and muscle. It is a sloughy

abscess, and is of an exceedingly dangerous nature ; and if the patient does survive the first period, the periosteum having in great measure sloughed away, new bone is not formed to supply the place of that which dies, and the patient will sink under the irritation excited by constant discharge, unless the limb be removed by amputation. The fever which accompanies this form of inflammation is typhoid, instead of being inflammatory, as in the other ; and the local pain is frequently not at all in proportion to the constitutional disturbance. In a case of this kind which I was called upon to see, the father of the patient, who was a medical man, had wholly mistaken the nature of the case, and had bled him repeatedly and largely, as for inflammation of the chest, although the fever depended upon this kind of foul abscess over the tibia. When I was called in, I laid the abscess open, which exposed nearly the whole of the tibia completely dead ; but the lad was then sinking with typhus fever. Another patient who was under my care, used, in the delirium of typhus fever, to get up repeatedly and walk about the ward of the hospital, if he was not watched,—so little pain did he suffer from the disease, although a foul sloughy abscess was forming around the whole femur, which I opened by incision through one of the vasti muscles and between the flexor muscles in the ham, by the side of the popliteal nerve. Mr. Keate mentioned to me a case in which the cause of a typhus fever was pointed out to his notice by his judiciously attending to his patient's crying out, in his delirium, "Holloa ! what are you pulling my leg for ?"—the pain of the inflammation raising this idea in his mind.

The inflammation not having been subdued in the first instance, for which purpose leeches, fomentations, and the mercurial action of calomel with opium, are most efficacious (if the degree of inflammatory fever allows of mercury), abscess is formed ; which was the state in which you saw Willis on his first admission into the hospital. I think it better in general, in the healthy kind of abscess, not to open it early, but to let it become fully formed, while the fever changes its character from an inflammatory one into a stage of irritation. If, indeed, the patient suffers much from the rapid formation of matter, while the swelling is tense and acutely sensible, you must open the abscess while it is still inflamed, in order to relieve the patient and prevent the forcible separation of the periosteum from the bone to a greater extent than would otherwise take place. In Willis, however, I delayed the opening ; and the consequence of this was, that the quantity of matter was much lessened, and he suffered much less both locally and constitutionally. This amendment was assisted by perfect quiet, with fomentation and poultice, and by a calomel and jalap purgative, on the 20th December and 1st of January. The constitutional change which I wished for had also taken place, so that he required a somewhat better diet, and slept and eat much better. In the sloughy abscess, on the other hand,

you cannot make an incision too early, even when the quantity of pus is very inconsiderable.

January 6th, however, Willis began to complain of more pain; the swelling began again to increase, and on the 8th I made an opening into the abscess and let out a large quantity of pus. This was followed (as it often is) by an increase of fever; for which he took saline mixture and antimony, but which would probably have been much greater if I had opened it in the first instance. This soon subsided, and on the 17th he began to take some bark and sulphuric acid, and had some porter allowed him.

Now comes the very important question in abscess around the femur—whereabouts is the opening to be made, and what is to be done while the abscess is discharging? You will say, perhaps, open the abscess in the most depending position, and make counter-openings if the abscess has burst in an unfavourable situation. In cases of abscess of the thigh, with necrosis, you will, however, find yourselves frequently baffled in this object. The position in which the patient almost always lies is with the knee bent on a pillow, the hip bent forwards, and the thigh partly turned outwards. The place in which the matter points, and the abscess bursts, if it is left to itself, is just above the knee-joint, below the lowest fibres of the vasti muscles; and generally it is on the inside, where the vastus internus turns round to be inserted above the patella. This is, therefore, in the patient's usual position, the very highest part of the abscess, and the matter is necessarily never emptied, and unless it discharges freely will force its way upwards towards the trochanter; being prevented everywhere else from coming to the surface by the thick vasti muscles meeting behind at the linea aspera, and in front beneath the rectus. The most depending position will be on the outside of the thigh, at the part of the abscess nearest to the hip; but very often you can scarcely tell exactly how high the abscess reaches. If you open it there, you have a deep and large incision to make through the vastus externus, and after you have made it, you find, in a short time, that the action of the muscle alters the relative position of the deeper part of the opening with regard to the more superficial, or the muscle granulates so quickly that the orifice soon becomes closed. This is especially the case if a counter-opening is made in this situation while one already exists near the knee; and you thus find yourself again obliged to make use of the opening which nature has chosen, however unfavourable it may appear. In Willis, however, the vastus externus being thin, I did succeed in keeping the opening permanently discharging, by once or twice slightly enlarging it when it was threatening to become obstructed. In a stout muscular person, however, so much difficulty is experienced from the cause I have mentioned, that it is generally better to keep the orifice near the knee sufficiently large to prevent bagging of matter, while compression is made by straps of plaster round the upper

part of the thigh (in the uninfamed state of the abscess), so as to prevent the matter from making its way towards the hip. Provided the quantity of matter is not very great, this is better than irritating the patient by repeated attempts to get another opening through the vastus externus; by which also, blood, getting into the abscess, will sometimes excite fresh mischief.

But I have another circumstance to point out to you with regard to abscesses connected with the femur, which you may easily believe from what you have seen of Chandler's case, and which renders it the more desirable to procure, if possible, an opening on the outside rather than on the inside of the thigh;—it is the frequent occurrence of alarming and even fatal hæmorrhage from the incision which you make in order to enlarge an opening situated at the margin of the vastus internus. This incision, I conclude, opens the anastomosing branch of the femoral artery, as it crosses towards the front of the knee. I once had very alarming bleeding at the time I made an opening in this situation, and had considerable difficulty in finding the vessel; for which purpose I was obliged to make the incision still larger. More frequently the vessel is opened by slight ulceration of the edges of the wound some days afterwards; the consequence, no doubt, of the excited and irritable condition of the circulation during this tedious complaint; and of this hæmorrhage I recollect two patients dying. One was a patient in whom an abscess formed under the vasti, of the same kind as in necrosis, after an ivory tumour had been removed from the femur; the other was a case of necrosis of this bone. There was a third patient, under Mr. Babington's care, about two years ago, who was very near dying after repeated returns of bleeding, apparently from the same vessel; which, however, was finally stopped, when he was almost exhausted, by tying the superficial femoral artery. So that you must by no means consider the danger from this cause, in necrosis of the femur, as merely imaginary.

Now let us follow Willis's case a little further. The abscess having been opened on the 8th of January, and the opening once or twice slightly enlarged, the boy continued gradually to improve in health till the middle of April; his health, having been supported at times by bark and quinine, as well as by porter and good diet, had become very good; and the thigh was so much improved, and the discharge so much lessened, that he was allowed to sit up daily, the limb being supported by strapping and by a splint, lest, during the separation of the dead piece of the femur, which was several inches long, the new bone which was forming should be broken—an accident which I have seen, and which is exceedingly difficult to treat: indeed, when it does occur in the thigh, the limb will generally require to be amputated, as the insufficiency of the new bone to support the weight of the limb commonly shows such a state of system that the patient is not likely to get well unless it is performed.

About the 20th of April, however, an unfortunate attack of erysipelas completely changed the state of things: it was of a somewhat severe character, and of the low kind that we most commonly see in the hospitals; and the effect of it has been the formation of one or two foul abscesses in the leg, and (a circumstance of more importance) an abscess in the knee-joint, with ulceration of the cartilages. Now you will observe that the thigh-bone being in a state of disease, this limb was the part which was attacked, although everything was at the time going on favourably; and the case shows you how formidable an attack of erysipelas is upon the whole limb, affecting every texture, though we usually regard it as a disease only of the skin and subcutaneous textures. A man was once under my care with inflamed synovial membrane of the knee-joint, and an attack of erysipelas caused the same rapid ulceration of the cartilages of the knee, with very extensive abscesses; of which he died after several weeks' suffering, without any opportunity of my removing the limb. A poor chimney-sweep was under my care, with necrosis of the femur and extensive abscess, as in Willis. This went on very well, however, and a large swelling of new bone was felt around the ends of the dead piece—one near the knee-joint, the other about half-way up the thigh. An attack of erysipelas came on, and caused the entire absorption of the new bone, with considerable increase in the extent of the dead portion of the bone; so that the next time the prominences formed by the new bone at the ends of the dead piece were distinguishable, the upper was nearly as high as the trochanters, and the lower one was very near the knee-joint. In the misshapen bone which I now show you, you may see the consequence of an attack of erysipelas upon a fractured thigh-bone. The patient had recovered from the accident, and was in a few days going to be allowed to walk about, when a severe attack of this disease took place in the foot and leg. Besides the most extensive abscesses in the leg and thigh, a large mass of new bone in the seat of the fracture was absorbed; the bone became again flexible, and in consequence of the great irritation of the abscesses, with much sloughing of skin and cellular membrane, during several weeks that the patient lived, and the total impossibility of employing pressure in any part of the limb, union took place a second time in this distorted position. The bone united too, although one of the abscesses was situated below the vasti, and communicated with the fractured bone, a portion of which you will see dead, and enclosed in new bone. So that the whole case formed, as it were, a very curious instance of necrosis.

Thus, then, the joint in Willis's knee is completely disorganized, and I conclude I shall have to amputate the limb, as soon as his health becomes sufficiently restored, as the only means of saving his life;—not, indeed, merely on account of the abscess in the knee-joint, for of that alone there would be a possibility of his recovering. A young woman, for instance,

called at my house, a day or two since, with a very useful limb, although I was obliged several years ago to make two openings into her knee-joint. But I expect that I shall have to amputate this limb because of the extensive mischief in the thigh, in addition to the abscess in the joint. [See *postea* p. 367.]

Now, here, again, is another practical question with regard to Willis's case. You saw that I opened the abscesses formed by the erysipelas in the leg as soon as they were perceived, while I did not do so with the knee-joint, notwithstanding the excessive pain which he suffered while the abscess was forming; because, in fact, I believe it to be good practice not to open an abscess in a joint very early. You must distinguish between the pain which arises from the ulceration of the cartilages during the formation of the abscess—and which, you know, is often very great for several weeks, before matter forms—from the pain arising from the abscess itself in the joint; and if you are not obliged to open it from distension, it is better to wait till the ulceration has proceeded further; you do not prevent this process by doing so, and you avoid the irritation which will sometimes follow your puncture of the joint in an earlier stage: by postponing it, in fact, you gain the relief afforded by opening an abscess, instead of the risk arising from a punctured wound of a joint.

The next fact you will observe is the contrast between the effects of a disease of the skin, as erysipelas may be called, upon the knee-joint, and those of a deep abscess very near the joint, with acute inflammation of the femur, forming, as it does, part of the joint itself. The fact is, you will find in practice that the effects of necrosis of the thigh bone, or indeed of any other of the long bones, very seldom extends into the nearest joints, but fortunately for the patients is almost always bounded by the epiphyses, and confined, therefore, to the central shafts. In the little chimney-sweep, whose case I have already alluded to, the knee-joint was swelled very considerably with synovia at the time of his admission, and the ligaments were so relaxed that very considerable lateral motion of the leg upon the thigh was allowed, and yet in spite of the mischief of the erysipelas, the joint returned to its natural condition, and when I saw him some time afterwards the dead bone had nearly come away, and he was walking about. In a boy whom you may have seen attending the hospital as an out-patient, the whole shaft of the tibia died, and was removed by operation, leaving the limb for a long time flexible, as if with fracture: both the ankle and knee-joint were much swelled on his first coming under my care, and there was some bone exfoliating even from the epiphysis itself, close to the knee-joint, so that I considered the loss of the limb as almost inevitable; yet no ulceration of the cartilages took place, and he has a very useful leg. Still, however, it does occasionally take place, and more frequently in the necrosis which happens

in adults from cold or injury, than in young persons, the epiphysis in whom is still separated from the shaft by cartilage ; and when this ulceration does take place, with abscess in the joint, you can scarcely expect to save the limb. [Mr. Hawkins then showed a preparation in which the cartilages had been thus destroyed by rheumatic inflammation and abscess of the femur, but the patient's health gave him no opportunity for amputation.]

A patient having survived the irritation of an abscess during the worst stage of its formation, the very curious process of reproduction of the dead bone is next seen—a wonderful operation of nature, which I am never tired of watching. You saw this in its early stage in Willis, till it was unfortunately put an end to by the erysipelas, and you have seen its result, although three or four years had elapsed, in Chandler's case.

In Willis, the periosteum, having been thickened by inflammation, was separated from the surface of the shaft, remaining still attached to the lining surface above and below the dead portion ; matter is secreted within it, and thus the periosteum, united to the part around, forms the parietes of an abscess in which the dead bone lies ; but at the same time, if the matter is secreted rapidly, the periosteum does not remain in one entire piece, but more extensive abscesses are formed, frequently filling the whole of the cavity formed by the vasti ; so that while these abscesses communicate with that in which the dead bone lies, there is still some thickened periosteum covering the living bone elsewhere, the pus being in this manner on the inside of the periosteum at one part, and on the outside of it at another. Supposing, therefore, that matter is felt nearly all the way up to the trochanters, it does not follow that the whole of the thigh bone, which is enclosed in the matter, is dead, but the periosteum may be vascular enough to preserve part of the bone, although separated by a good deal of matter from the surrounding muscle. In Willis, it was evident by the probe that the entire circle of the shaft was dead at one part, and the dead bone in front could be felt for several inches in an extensive abscess. Still you observed that new bone began to form, which in some measure surrounded this old bone. If the periosteum is much destroyed, as in the foul abscesses I before described, new bone cannot be formed in sufficient quantity to preserve the limb ; but in Willis, the abscess having been of a healthy kind, this curious process went on favourably. At first, it is generally formed at the two extremities of the dead piece, and two prominent ridges mark the boundaries of the living and dead portions ; then, as the matter begins to diminish in quantity, the periosteum returns nearer to the dead shaft, condensed and united to the parts around ; then this begins to secrete new bone, and a case is formed entirely surrounding the dead piece, with the exception of one or more openings through which matter continues to pass away. At this period the dead piece is still attached to the living portion of the shaft, but

next ulceration takes place at the extremities of the mortified bone, and the dead portion or sequestrum separates into the cavity of the new bone. In general, before this takes place, the new bone is firm enough to bear the weight of the limb, being attached to the epiphyses, or wherever else the mortified piece terminates; still sometimes the separation may go on more quickly; so that you will see the propriety of supporting the limb by strapping and by pasteboard, or other light splints, as I directed in this boy. So far, then, you observed this process in Willis, and you saw how little pain or inconvenience was felt while it was going on, so that he sat up and moved about freely on crutches. Dr. Macartney published a case in which nearly the entire shaft of the femur separated in one piece, and stuck out of the surrounding bony case, while the patient was going about, the end getting in the way of his breeches, till one morning in bed he gave it a tolerably firm pull, and extracted it.

In this state you will often see nearly the whole length of the tibia or humerus extracted by operation in this hospital.

More frequently, if it is left to itself (the removal of the greater part of the femur being too severe an operation to be performed as early as you may do it in the other bones), the dead bone is divided into several pieces, and comes away through numerous openings, during a considerable time. I may allude again to my little chimney-sweep, in whom almost the whole shaft thus came away, in about a year, through ten or fifteen openings, without any assistance from surgery; for he did not choose to show himself, lest any operation should be performed, till the exfoliation was nearly completed. It is surprising how much the dead piece is thus broken up and diminished by absorption, during its contact with the living parts, so that the pieces which actually come away are often not a quarter of the bulk of that which has died. This power of absorption is shown by an experiment of Sir W. Blizard, who put a piece of dead bone on a common ulcer of the leg, and found it much diminished in size.

Sometimes, a considerable portion remains locked up for a long time, and then becomes accidentally loosened, or produces fresh irritation, and successive abscesses are formed, to allow of the separate portions coming away, or an operation is required for their removal, as in Chandler. When at last the whole has come away, it is astonishing to see how nearly the limb is restored to its original state, the great misshapen case of new bone being gradually absorbed again on the outside, while more is deposited on the inside of the case, till at last you can scarcely see any difference between the diseased bone and the sound, in shape and appearance.

When a portion of dead bone is firmly locked in, and is not broken down by absorption, from being too hard, or from the living part around it being sufficiently vascular, an operation becomes necessary by which it may be

extracted. It might, indeed, very often be left with safety to the operations of nature ; but many years are often required for this purpose, during the whole of which there is more or less inconvenience to the patient, with a troublesome discharging abscess, or numerous sinuses. Nor, indeed, is the patient's condition always without danger, from the constant drain and irritation, or from numerous small abscesses which form from time to time. All this inconvenience may be remedied by an operation—painful, indeed, but not often attended with risk ; and several years of suffering may be saved by thus assisting in getting rid of the sequestra. For instance, an old soldier was under my care in the hospital, whom I operated on twice for strangulated hernia : after the first operation, he complained of a constant discharge from one side of the nates, which materially impaired his health and which came from a sinus that led to a dead piece of bone on the back of the ilium. He had been wounded nineteen years before, at the siege of Badajoz, by a musket-ball, which had pierced the abdomen in front, and gone through the ala of the ilium. By an incision through the glutei muscles, I removed a piece of bone the size of a half-crown, and scraped away a little carious and living bone around, and it directly healed, and has continued sound ever since. If, then, so many years were here insufficient to get rid of the dead bone, even from the ilium, where it was unconfined, it is not surprising that the same operation is often required in the long bones, where a quantity of new hard bone surrounds the sequestrum.

Such, then, was the case in Chandler, after three years and a half. The lower third of his thigh was of an immense size, from very hard new bone, in which there was one opening of a small size leading into a considerable cavity, enclosed completely by new bone, except at this orifice, which was situated in the part I before spoke to you of, near the lower end of the vastus internus, and just above the internal condyle of the femur. In this cavity was felt a considerable piece of dead bone insulated, but apparently fixed at the two ends by the new bone. The soft parts were adherent to the new bone round the edges of the opening, while the muscles were in a natural state elsewhere.

The operation for necrosis must vary according to the particular circumstances of each case. What I did for Chandler, on the 13th of December, was this :—I first divided the skin above and below the opening, and separated it from its adhesion to the new bone ; and with a trephine I removed two pieces of the new bone, so as to expose a good deal of the old and dead portion which was loose ; but the ends being broad it could not be extracted without being divided into two portions, or the opening in the new bone being made much larger. I first tried to divide the dead piece with a small key-hole saw, directing the edge of the saw forwards, so that the back of the saw was towards the popliteal artery, which was of course very

near the bone, but by this means perfectly safe. The bone was, however, too hard to be cut through in this manner without great difficulty. I placed, therefore, a small trephine upon the edge of the centre of the dead piece, and thus easily divided it into two portions, which were readily extracted through the opening. When joined, the sequestrum was about four inches long, and between two and three inches broad; being the back part of the bone, where it is flattened and expanded into the condyloid part. The wound was dressed with a piece of lint in the cavity of the bone, and, as nothing but skin was divided, there was no vessel that required tying.

The operation for necrosis is always a painful one, and the wound almost always becomes more or less foul and sloughy; in this case, however, when the lint was removed on the 18th, the wound was very tolerably healthy, and was beginning to granulate well; so that there seemed no reason to anticipate, from the state of the parts, what took place the next day.

December 19th, while exerting himself in bed, there took place sudden hæmorrhage from the wound, and the house-surgeon (Mr. Cooper), who was not far from the ward at the time, was immediately called, and came to him almost directly. He supposed that not less than three pints of arterial blood had already escaped, and that nearly a pint more was lost before he could stop it by pressure, and then applied a tourniquet. I arrived at the hospital in almost half an hour, at which time he was quite exhausted, and bathed in cold perspiration, and with scarcely any pulse to be felt even in the femoral artery; and this was not from alarm, for nothing can have been greater than his firmness and composure during all the severe operations he has gone through, and which certainly have been more than the usual share of one person; but his state was evidently owing to the quantity and suddenness of the bleeding.

The question then was, what was the source of this hæmorrhage, and what was to be done for him; as the repetition of the bleeding, even in small quantity, must have been fatal.

The bleeding was clearly not from the anastomosing vessel which I before spoke to you about, but deep from the bottom of the wound—from some vessel, or vessels, opened by ulceration or by sloughing, in consequence of the operation. Mr. Cooper described the bleeding as being so great that a stream of several inches high issued from the wound (large as it was), and as being entirely arterial. As, then, the wound was not sloughing extensively, so as to open at once a great number of arteries, it seemed scarcely doubtful that the bleeding was from the popliteal artery, which, although untouched by the instruments, might yet have been injured by the end of the sequestrum, close as it lay to it in the wound, so as to bleed when opened by ulceration a few days afterwards. This, then, was the decided impression of all the gentlemen who happened to witness the hæmorrhage; and from this account

of the quantity of blood lost during the short time that it lasted, and the state in which I found him, I entertained no doubt of its correctness.

Upon consideration of the following important questions, I determined at once to tie the femoral artery, which was directly done, and, as it proved, with perfect success.

1st. There is no doubt that, upon the first discovery of the freedom of anastomosis, when even the largest arteries were tied by some of our own most distinguished surgeons, the surgeons of this country were induced to be too sanguine as to the resources of nature after such operations, and were induced to lose sight of the different circumstances in which the circulation is found when a large vessel is tied in a case of aneurism, or of a wounded or ulcerated artery. It is to the large scale on which such cases were seen by our army surgeons, of whom no one has insisted more upon this point than Mr. Guthrie (whose recent work upon this subject I recommend to your study), that we are indebted for a more correct knowledge of the fact that there is a much greater chance of failure of the circulation, and consequently of mortification, where an artery is tied suddenly in a case of wound than in a case of aneurism, where the capillary vessels have already had time to become somewhat enlarged, by the impediment to the current of blood through the main trunk, produced by the disease. Certainly, from several instances which I have seen, I am inclined to believe with them, that if the main artery and vein are both obstructed by a ligature, or in any other sudden way, the death of the parts below is almost inevitable. But when an artery alone is tied, I cannot but think that the danger has been somewhat exaggerated, and that the dread of mortification has arisen from so many of the instances adduced having been cases of gun-shot wounds, or other severe injury, in which the blood driven into the soft parts, or the swelling necessarily following the wound, has contributed very much to the fatal result by pressure upon the neighbouring small vessels. Where there has been injury of this kind, no doubt you will very often see the occurrence of mortification; but in cases of simple obstruction I cannot think that it is often to be looked for, though doubtless somewhat more frequently than after the operation for aneurism. In this patient, you will have observed that although the femoral artery was thus suddenly tied, and there was a considerable mass of disease below the ligature, not only was there no coldness of the limb, but there was not even the increased temperature of the surface which commonly attends the ligature of this vessel a short time afterwards, even in aneurism, in consequence of the altered condition of the capillary circulation: the sensibility and temperature of the limb were throughout exactly the same as in the other leg.

2ndly. Another point to be considered, is the frequent occurrence of secondary hæmorrhage in cases of wounded or ulcerated arteries, upon the return of the circulation after the vessel has been tied at a distance from

the bleeding point, either from the artery between the ligature and the wound, or from the part of the artery below the wound. No doubt you will be correct, in cases of wounded artery, if the wound is considerable, in cutting down upon the injured part, and placing a ligature both above and below the wound, wherever this is practicable. So, also, where there is a simple slough at the side of an artery, as by a gun-shot wound, this would doubtless be the best operation, if it can be done without difficulty.

But I very much question the propriety of this operation in cases where the vessel has been opened by a sloughing or phagedenic ulcer; in which it is difficult to know what vessel has been opened, or whereabouts the orifice may be, if we think we know, as in this case, what particular vessel is ulcerated; in which cases the wound has to be opened and enlarged in a painful and irritable condition, with almost always considerable difficulty in finding and securing the vessel in the midst of a quantity of sloughs and coagula. In such cases as these, in which mischief is progressively going on (in such a wound as Chandler's, for instance) after an operation, or in a sloughing wound after the operation for aneurism, or in a sloughing stump in all of which cases secondary hæmorrhage is frequent—I cannot but think that the chances of a return of bleeding from the wound in a few days, when the sloughing or ulceration has again reached the bleeding vessel, is greater than if we leave the wound itself quiet, while the patient's system is at the same time less excited and irritated by an easier and simpler operation upon a healthy part of the artery, at a little distance from the wound. Sometimes, indeed, when the system is very wrong, I have seen the same action established in the wound made to secure the artery. A man, for instance, had the usual operation for popliteal aneurism performed, and secondary hæmorrhage occurring a few weeks afterwards from the wound (which communicated with the sac of the aneurism), the femoral artery was tied by Mr. Brodie above the former incision. There was no return of bleeding from the former wound—which is the point I am contending for—but, six weeks after this, hæmorrhage took place from this second wound; and the bleeding being several times renewed, the common femoral artery was now tied. Again, the operation was completely successful as to the point at issue; there was no return of bleeding from below, but exactly at the same period after this operation as after the former—viz., six weeks—hæmorrhage took place from the last incision, and ultimately carried off the patient. Again: you will observe that if, after the vessel has been tied above the bleeding point, there should be a return of bleeding, it is generally slighter than before, and more easily controlled by pressure; and after all, if you do fail, you have the same power which you had at first of searching for the ulcerated artery in the wound itself. Much more frequently, however, I believe the operation will be wholly successful, as in our present patient, and as in

the case which I have just mentioned of Mr. Brodie's. Let me remind you too again, of the patient I before alluded to (Mr. Babington's), with the same disease as Chandler, in whom alarming hæmorrhage took place, probably from the anastomosing vessel. In this case the artery was several times secured by ligature in the wound, but each time the bleeding returned as soon as the vessel was again opened by ulceration. Then the femoral artery was tied, and there was no subsequent return of hæmorrhage.

Having, then, performed this operation, before the circulation has again become active enough to reproduce the bleeding, the object, of course, must be to produce a new and healthy action in the sloughy and phagedenic ulcer which has caused the hæmorrhage, by appropriate local and constitutional means.

I have nothing particular to say with regard to the tying of the femoral artery, which was done in the upper-third of its course, in the usual way. On the following day (December 20th) he still remained very low and feeble from the hæmorrhage, but had passed a comfortable night.

December 23rd.—A little piece of lint, which I generally place in the wound by the side of the ligature, was withdrawn, and which was useful in this case; for while the greater part of the incision had united by the first intention, the centre was rather foul and suppurating, probably from the pressure of the tourniquet, which had been applied just where I tied the artery. He had now some headache and fever, from the irritation of the lower wound, which was full of clots of blood, and was now beginning to suppurate extensively.

24th.—Fever nearly gone.

29th.—The tenth day, the ligature came away.

10th January.—Incision almost healed. Wound below healthy; and from it I withdrew a considerable fragment of dead bone, and several more small pieces were taken away subsequently. From this time, the wound got gradually better, and was contracted to a very small opening, so that he was walking about again without inconvenience.

2nd March.—Constant sickness, with febrile disturbance, for which some calomel and antimony, with saline mixture, were given; and the edges of the opening looked unhealthy.

4th.—Sickness continued, with diarrhœa: relieved by small doses of calomel, and antimony, and opium.

5th.—Profuse perspiration and great anxiety. Wound sloughing rapidly, with the peculiar appearance of hospital gangrene. Calomel and opium, with a little wine, were given; and chlorine solution and nitric acid applied to the wound, which on the 9th had spread to a considerable size.

10th.—System better; sloughing phagedæna apparently inclined to stop.

15th.—Wound decidedly cleaner, and the sloughing stopped.

I shall not detain you long at present in speaking of the peculiar circular phagedenic sore, called hospital gangrene, which indeed we seldom see in civil hospitals in an aggravated form, and which is also scarcely ever fatal. In military hospitals, however, it is occasionally seen in the most destructive form, and all agree that it is then both contagious (by means of sponges and dressings) and infectious. A very remarkable instance of its propagation by infection is told in a French hospital, at Leyden, in 1798, the wounded being in two rooms one above the other. The disease prevailing in the lower room, an opening was made in the ceiling and through the floor of the upper room, the consequence of which was, that in thirty hours it had become general in the upper room, the soldiers in which had previously been free from it, the first cases being in the beds nearest to this injudiciously made hole, and thence spreading to the others. With us, however, it never seems to be propagated in these ways, though there will now and then occur several instances of the disease in different parts of the hospital; for instance, you have seen very recently two cases of it in patients whose toe I removed.

In Chandler, the exciting cause seemed to be a disturbance of the functions of the bowels and stomach; and constipation, or alternate constipation and purging, very often appear to produce the disease: and the reason, no doubt, of our now and then having several cases at once, is the occurrence of this disturbance from peculiarity in the state of the atmosphere; in the same manner as the occasional prevalence of erysipelas as an epidemic is often traceable to similar changes in the barometer, or in the moisture of the air.

As soon, then, as you alter this condition of the bowels and digestive organs, the sloughing ceases: in Chandler, this was done by the influence of calomel and opium, with once or twice a rhubarb or senna purgative. But at the same time, in general, a nourishing diet is required, with a little wine or spirit; and the use of ammonia, with camphor or opium, followed by bark, as soon as the stomach bears it. Locally, a cold Goulard poultice, or hemlock, or stale beer, or Port-wine poultice, but more frequently solution of chlorine, or of nitric acid, will procure a more healthy action in the ulcers.

Under this treatment, then, the sloughing phagedæna in Chandler stopped, and the system improved; the sloughs were also gradually coming away, but now the ulceration which detached the sloughs produced a fresh danger.

18th.—A few small clots of blood were observed in the dressings of the wound, to which oil of turpentine was then applied repeatedly.

20th.—Under this dressing the wound looked gradually better, and he was improved in health.

21st.—Last night, bleeding to the amount of about ten ounces took place, by which he was a good deal exhausted.

23rd.—No fresh bleeding; wound better; decoction of bark and tincture of myrrh applied.

25th.—The house-surgeon, in dressing the wound, observed that there had again been some slight bleeding, and soon afterwards arterial hæmorrhage to a great extent took place, which was controlled for a time by a tourniquet. Mr. Keate, who was in the hospital, being called to him, enlarged the wound, but the exact source of the bleeding did not appear, though his fingers controlled it, when pressed upon the situation of the femoral artery. While he was thus engaged with Mr. Brodie, I arrived at the hospital, and considering his exhausted condition, and the impossibility of his surviving a return of the bleeding, together with the large and foul wound which had now been formed by the gangrenous ulceration, and the diseased condition of the femur, we agreed that amputation was the best thing that could be done for him. This operation I therefore performed immediately, below where the femoral artery had been tied, and partly across the incision which had just been made, but above the sloughy part of the wound.

We were now curious to ascertain the source of the present hæmorrhage, as well as the state of the popliteal artery from which the bleeding was believed to have come about three months before, and which it was thought might again have been opened by ulceration in another place. It appeared, however, that the bleeding was not from the trunk of the artery, but from several branches both of arteries and veins, the mouths of which were quite open on the surface of the wound, chiefly at the upper part, where they arose from the femoral vessels, just before the perforation of the sheath of the triceps. Upon further examination of the popliteal artery, no trace of ulceration could to our surprise be detected, so that in all probability the very sudden and copious bleeding, which was described to me at the time I tied the femoral artery, must have proceeded from branches only, opened in the same way by ulceration, and bleeding probably thus furiously in consequence of their having been opened, as they were at the present time, very near the main trunk.

Perhaps some gentleman may ask, as this patient had hospital gangrene, which is a constitutional disorder, why amputation was performed, or why, being performed, the disease did not return in the stump? You will observe, however, that the operation was performed, not because he had quite recovered that state of constitution which we should have wished, but to prevent the more pressing danger of death from bleeding; and also, that although the bleeding took place from phagedenic ulceration, yet the constitutional state on which it depended was very nearly corrected, and the wound was improving, so that the bleeding was rather from the ulceration during the separation of the sloughs, than from any recurrence or spreading of the phagedenic action. Although, therefore, amputation is obviously improper in hospital gangrene, which attacks even the least touch of the lancet, when it prevails, this rule would scarcely apply to our present case.

After the amputation, which he bore with the same perfect quiet which had been remarkable in the former operations, great care was necessary to prevent his sinking from the effects of the quantity of blood he had lost beforehand. He lay during the night, with copious perspiration and a rapid pulse, scarcely perceptible, in a half-dreaming state, though not delirious, and incapable of even turning his head on the pillow, from exhaustion. Some gentlemen were kind enough to stay with him during the night, and give him constantly some small quantities of wine and water, sago, beef-tea, and other things of this sort, to prevent his sinking. The next day, the 26th March, he had a little sickness, which was stopped by a small quantity of brandy and water, and he enjoyed a beef-steak.

28th.—The stump had in part united, though beginning to suppurate extensively, and afterwards went on very well; so that by the end of April the wound was gradually closing, and he could sit up on the outside of the bed.

[The immense mass of new bone in the part which had been removed was shown to the pupils, the cavity in which was of considerable size, and had still some small spiculæ of dead bone lying in it. The femur, at the part where it was sawn through, was considerably enlarged by new bone, and the whole of its cancelli obliterated.]

Since the lecture was given, Chandler has left the hospital quite well.

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CLINICAL REMARKS ON AMPUTATION, &c.

Case 1. Ulceration of the Cartilages of the Knee-joint from Scrofula.—Case 2. Ulceration of the Cartilages of the Knee-joint from Erysipelas.—Case 3. Disease of the Femur, with Hæmorrhage.

Mr. Hawkins began by observing that he had been obliged, as he expected, to amputate the thigh of a boy named Willis, whose case had been the subject of a former clinical lecture [see *ante*, p. 352]; and as there were two other patients in the hospital for whom he had performed the same operation, he would take the opportunity of noticing some circumstances connected with the operation of amputation which had occurred in the progress of these cases.

You will observe (Mr. Hawkins continued), that I did not remove Willis's limb simply because there was an abscess in the knee-joint, with ulceration of the cartilages, because that may sometimes be cured; but because the condition of the joint was complicated with a good deal of disease in the thigh also. Ulceration of the cartilages will sometimes follow an injury of the joint, and an acute abscess may take place, of a formidable nature, indeed, but still of a healthy character; so that if the patient survive the severe constitutional disturbance that accompanies such a state, ankylosis may

subsequently occur, and the limb may be preserved. In the smaller joints, the elbow or wrist, for instance, I have even several times known portions of cartilage and bone exfoliate, and yet a useful limb remain to the patient.

So also when ulceration of the cartilages takes place without injury, from morbid action of its own vessels, or from disease of the synovial membrane extending to the cartilages, a recovery may occasionally take place. A young woman called at my house the other day, with a very useful leg for everything but kneeling, who was formerly under my care in the hospital with ulceration of the cartilages of the knee-joint, into which an opening had been formed by abscess in two different places. In some rare cases after ulceration of the cartilages, even some degree of motion is preserved; in which case cartilage is not regenerated, but a smooth bony surface, or hard kind of ivory deposit, supplies its place.

When ulceration of the cartilages takes place in consequence of disease in the bones composing a joint, ankylosis does not so frequently occur as when it arises from either of the other causes which have been mentioned; yet you will very frequently see diseased joints, arising from serofulous action in the epiphyses of the long bones, get permanently well, although ulceration of the cartilages has taken place, and has caused numerous abscesses in and around the joint; the joint being, of course, more or less stiff. There is a girl now attending the hospital, however, as an out-patient, who has had this disease for several years in the elbow-joint. When I first saw her, the epiphysis of the humerus was apparently firmly ankylosed with the ulna, and there was a complete separation, with free motion between the epiphysis and the shaft of the humerus, with copious discharge of pus from several sinuses communicating with the diseased part, so that I thought the loss of the limb almost inevitable; but by attention to the general health, union has taken place by new bone between the separated pieces of the humerus, and she will preserve the arm in an useful state for many purposes, as the ankylosis has taken place in the bent position of the joint.

Of this latter nature, probably, was the origin of the disease of the knee-joint in John Johnson, æt. 24, admitted April 18th, 1833, with the following history. He fell from a ladder twelve years ago, bending his knee under him with great force, and from that time his knee has been weak and painful whenever he used it; and occasionally he has been laid up for a few days at a time, with increased pain and inflammation. Thirteen weeks ago great swelling took place around the joint, especially in the ham, yet, notwithstanding this, he continued his work, the limb being bandaged in flannel; and while thrashing, an abscess burst in the ham and discharged two quarts of matter. After this he kept his bed, having very copious discharge continued; and about a month afterwards another abscess was opened by the surgeon, below the patella, on the outside of the leg, and a pint of pus

evacuated, which was mixed with blood. At the time of his admission the whole joint was much swelled with fluid, and on the inner side a considerable projection of the inner condyle was felt, as if it was enlarged, or had a bony tumour upon it. This part was not painful, but on the outside there was a good deal of pain and tenderness of the joint; and violent pain was produced by pressing the patella (which was somewhat displaced upon the outer condyle), against the bone below. Both the orifices of the abscesses allowed the probe to pass to a great depth; that in the ham towards, and probably into the knee-joint, though no bone was felt; that on the outside of the leg allowed the probe to pass towards the joint, and dead bone was felt in the tibia, close to the joint of the fibula with the tibia.

From the history of the case, therefore, and the age at which the disease commenced, it was probable that there was scrofulous disease established in the bones of the knee-joint (part of the tibia being now dead), which had subsequently spread to the joint itself, the cartilages being in a state of ulceration, and the abscesses probably leading into the joint, so that amputation seemed necessary.

The pain and swelling were first diminished by once cupping the knee, with cold lotion and rest. The operation was further delayed, however, by an attack on the 22nd of acute gangrenous inflammation round the opening of the abscess in the front of the leg, with great pain, and extensive dark redness of the parts around, there being almost complete stagnation of the blood in all the superficial veins of the leg and thigh. There was at the same time a good deal of constitutional disturbance, the pulse being 120, and the countenance expressing great anxiety. For this an effervescing draught, with carbonate of ammonia, and twenty minims of laudanum, were given every four hours, and a cold Goulard poultice applied.

23rd.—The next day the gangrene had apparently stopped; he had had a good night, with little pain, and the pulse was only 90, and quiet.

The portion of skin and cellular membrane which were destroyed in this short time was nearly as extensive as the palm of the hand; but all the dark appearance of the surrounding parts, and of the veins of the limb, was gone. His mixture was continued, and three ounces of wine given him, which the next day was increased to six.

27th.—The large slough had come away, and a healthy ulcer exposed. Draught continued every six hours, with five minims only of laudanum.

30th.—The wine and some of the extra diet were omitted.

On the 2nd of May his health was sufficiently re-established for the operation, and I accordingly amputated the thigh in the usual way. The cartilages of the joint, which you may see, were extensively ulcerated; the dead bone which was exposed was found to be loose in the head of the tibia, in the joint; and both the abscesses communicated with the interior of this cavity.

In Johnson's case the amputation was performed entirely above the diseased parts, or at least there was nothing but a little softening of the bone from disuse, with a corresponding laxity of union between the bone and its periosteum, which makes exfoliation after the operation a little more likely, but does not influence the mode of operation. But in the other two cases there was something more.

In Chandler, whose case we considered in the last lecture, the bone was almost double its natural size at the point where it was sawn across ; yet you see that the inflammation of the bone has not in the least interfered with the success of the operation ; no bone has exfoliated, and the stump is now nearly well. There was also in his case some condensation of the muscles from inflammation, which is a circumstance that will give you trouble in many operations ; for the vessels in such cases cannot retract nor contract, and a vast number generally require the ligature ; and when you apply the silk, you find that the vessels have become quite brittle ; the same vessel often requires to be tied several times before it is secure ; and frequently you are obliged, instead of the tenaculum, to use a hook or a needle, and to enclose a little of the surrounding substances with the artery. Some gentlemen may recollect how much trouble was given by this state in the patient whose arm Mr. Brodie amputated not long since at the shoulder-joint.

In the operation in Willis's case, the state of the part was peculiar. The abscess around the femur extended up nearly to the trochanters, and it seemed probable, from the quantity of new bone which had formed around the necrosed part of the shaft, that dead bone reached up nearly as far ; so that unless the amputation was performed very high up, which would render the operation considerably more dangerous, and would make the use of a wooden leg more difficult, from the shortness of the stump, I should have to divide a large abscess, and a mass of new bone, with inflamed soft parts, around a large piece of dead bone. The preservation of as much of the limb as could be kept with safety seemed of so much consequence, that the cutting across the vascular and inflamed part of the new bone and periosteum seemed, for the same reasons as in Chandler's case, to present no obstacle to the removal of the limb low down.

With regard to the dead bone, as a considerable time had now elapsed since the commencement of the disease, it seemed not improbable that it might be sufficiently loose to allow me, after having sawn across it, to extract what was dead from the end of the stump at the time of the operation ; or else, if it was not then separated from the bone, that it would come away with facility at some future time. You will see by the preparation, that I was agreeably disappointed as to the extent to which the whole circumference of the bone was dead ; it was so near the epiphysis, but at the part

where it was sawn across, not above a third of the circumference was actually dead, which is hard and white, and firmly locked in by the old bone which remains alive, with the addition of a considerable quantity of new bone around it. You may see in the longitudinal section of the bone, which has been made, the very curious circumstance of some living cancellous structure enclosing a small abscess, which is almost entirely surrounded by the original ring of the femur, which has died. This is a fact which has been sometimes observed in experiments on animals, but which is not often seen in the human subject, in whom the separation or death of the periosteum is almost always followed by the destruction of the membrane of the cancellous structure also. The appearance of the end of the bone will, of course, show you what is the state of the bone at the end of the stump. I could not extract the dead part, though it does not probably reach very high; and it must be left to be partly absorbed, or to exfoliate, at some future time. [Two months after the operation, a piece of bone about three inches in length was extracted, the stump having some time previously healed up, with the exception of a small sinus leading down to the dead bone, and the boy has since left the hospital, a vast quantity of new bone having formed since the operation, which has made the thigh almost twice as large as the sound one.]

In the next place, with regard to the abscess, it is very troublesome to cut across one in an amputation; but as this reached on one side of the bone to the trochanter minor, it seemed better to do so than to perform the operation so high up; but then such a method should, of course, lead to an entirely different mode of dressing after the operation. Union by the first intention does not very often occur after amputation; still it will do so occasionally; and it is therefore right to attempt to produce it when nothing forbids it. In Johnson the whole stump united by the first intention, and great part would probably have continued united, had it not been for the occurrence of erysipelas. In Chandler the number of ligatures interfered with complete union, and I brought them, therefore, all out at the centre of the wound, so that only the two extremities of the wound were allowed to unite; still a good deal was thus gained. In Willis, however, more was required, and I introduced a piece of blue lint (lint dipped in a solution of sulphate of copper) into the whole length of the abscess, by which the interior has been made to slough partially, and the centre of the wound has been prevented from uniting. In cases of this kind, then, where no union is at all probable, you can often introduce a piece of oiled lint, in order that matter may not be confined by the union of the edges of the skin; still even in these cases there is no necessity to cram the wound with lint in the Continental style, since the union of half or a third of the wound at the two ends of the incision is of great use.

Again, in common cases, the wound should be left undisturbed for several days ; as in Johnson, in whom the plaster was not taken away altogether for a full week, while in Willis I withdrew the lint on the second day ; and you may see, in the few days that have elapsed since the operation, that the discharge has become quite healthy, and the cavity of the abscess is already contracting, from the free exit afforded to the matter, and the new action produced by the stimulant application, while the two ends have firmly united.

Another point of great importance in the treatment of amputation, is the constitutional treatment of the patient after the operation. Where it is performed after an accident, it is often of great service to take away a small quantity of blood in the evening, or the next day, and to keep the patient strictly on low diet for several days ; the fever which follows the operation being inflammatory : but where amputation is performed in consequence of disease, the case is wholly different. In Willis there had been much suffering, with hectic fever, previous to the operation ; the cause of which being removed by it, he slept better the night after the operation than he had done for some time previously ; but having been reduced by long continued disease, he did not require to be treated on the antiphlogistic plan. The only difference that I made in his treatment, before and after the operation, was to discontinue the wine that he had previously taken, but he was still allowed his porter, and fish or meat, with an opiate, to which he was now accustomed, and without which, though no longer kept awake by pain, he could not procure sleep. His tongue continued moist and clean, and, three days after the operation, instead of having fever of an inflammatory kind, there was a sensation of rigor, with a feeble pulse, and blueness of the lips, that induced me to order him again some wine and beef-tea, which restored him the next day to a more comfortable state.

In Johnson, also, the antiphlogistic plan very soon required to be changed for a better diet, and in a few days more for wine and brandy, and other stimulants, to prevent his sinking from exhaustion. He had a good deal of irritation previous to the operation, from the acute gangrene, which I have before mentioned ; and a week after the operation was attacked with severe bilious vomiting, followed by erysipelas, which have drawn largely upon the strength of his system. This bilious erysipelas, as Dessault calls it, very quickly exhausts the patient, from the excess of vomiting, and the form which it assumes indicates the debility of the system. You never see erysipelas of the pale colour, and erratic form, which it assumed in Johnson, without being assured that the patient requires a good deal of support. Beginning on the stump, there is now no part of his body on which it has not successively appeared, except his remaining foot and one hand, and even on these it seems gradually creeping, after having lasted about three weeks.

In Chandler, again, exhausted by hæmorrhage, and by his attack of hospital gangrene, constant support has been required, besides the stimulants which were at first necessary, to prevent his sinking from weakness. It is obvious, then, that very different modes of constitutional treatment will be indicated after amputation, according to the state of each individual patient.

The next circumstance which I will allude to, is the occasional occurrence of retraction of the soft parts after amputation, producing protrusion of the bone, and an ill-formed conical stump. We are but too apt to attribute this, and other circumstances, to the fault of an operation, which may be the result of other causes ; and Johnson's case will show you, perhaps, how this retraction takes place. There were amply sufficient soft parts to cover the bone, there was union by the first intention through the whole incision, and there would have been a very good stump but for the occurrence of erysipelas, with its accompanying constitutional disturbance. The consequence of this was an immediate absorption of the uniting medium, and retraction of the soft parts, with a foul and sloughy cavity. I recollect another case, in which, a few days after amputation of the thigh, a foul wound of the same kind was formed without erysipelas, the consequence of which was a similar contraction of the muscles. In a few days the constitutional disturbance ceased, and the wound cleaned, and the stump could again be readily covered without any force. About three weeks after this, secondary abscesses formed in the liver, and then, while the wound was quite healthy, and granulating well, the constitutional disturbance caused by the internal suppuration, caused retraction of the stump a second time, which again ceased before his abscess in the liver carried him off. You will easily understand, therefore, why retraction of the soft parts is more frequent when amputation has been performed for disease, than when it is done in consequence of accident ; the irritation, or hectic, in the former case, tending to the production of this occurrence, which a person in a state of health avoids, though the operation be equally well performed, and there is exactly the same proportion of the integuments and other soft parts.

Now if retraction does take place, it is no use whatever to draw the integuments forcibly forward in order to bring the surfaces together : wait till the state of the system alters, and you have got rid of the irritation which produced the retraction, and then you will probably be able to close the wound again as well as at first. This was nearly the case you saw in Johnson in a few days, even although the erysipelas continued in other parts of the body for so long a time. In this particular case, however, although a pretty good stump might ultimately have been formed, yet it could not have been done very easily, because the erysipelas had caused some thickening and condensation of the muscles and cellular tissue, and had produced also a little sloughing of the skin at one part of the wound. This

was readily stopped indeed by chlorine and tincture of benzoin ; but still I thought it better to hasten the filling up of the wound, and to insure a still better stump by removing about an inch of the end of the bone, and the rather because a little portion of one side of the bone would ultimately exfoliate. This little operation could be done at this period without any difficulty whatever, the granulations upon the bone (which were very exuberant, and formed a considerable projection from the cancellous structure), being just cut through, and the end of the bone sawn off. The stump was still at that time foul ; but under our green dressing and other applications, is now healing fast. [Johnson has, in fact, as well as the other two patients, since left the hospital with a very good stump.]

The last occurrence which I will detain you by alluding to is the occasional exfoliation of the end of the bone in the stump, which will take place, no doubt, sometimes when there is nothing wrong in the operation, but which may, to a certain extent, be prevented by attending to these circumstances. When a person has suffered from long illness, or when the bone which is to be cut across has been inflamed, the periosteum becomes less closely attached to the bone, and during the operation it is liable to be torn away from its extremity. Thus, I rather expected a little exfoliation of bone from observing this fact in Johnson at the time of the operation, as there was some difficulty in securing all the vessels, and there was a good deal of spasmodic action of the muscles. In Chandler, also, a little portion of bone was exposed for the same reason, but the bone being more vascular—being, in fact, solid throughout in consequence of inflammation, no part appeared to die from the exposure. Another cause, I am inclined to think, of exfoliation after amputation is the too rapid motion of the saw, which is itself sufficient to excite inflammation. Certain it is, at all events, that from some cause or other the death and exfoliation of a small ring of bone is not uncommon, and now and then of a still larger piece. I have seen, for instance, a piece of bone of several inches which had thus exfoliated after the operation, though more commonly it is only a small ring of the outer surface from the extremity of the bone. When a piece is thus felt exposed and dead, it should not in the least alter your treatment of the case : let the stump heal as far as it will ; a little sinus will remain for a time, at the bottom of which the dead bone is felt, or a projecting mass of fungous granulations will make it appear likely that such a portion exists, though you may not be able to feel it, and the exfoliation will come away at some future period, or the dead piece will be absorbed ; but in either case it seldom gives much trouble.

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CLINICAL LECTURE ON SECONDARY ABSCESES.

1. Uterine Phlebitis—Secondary Abscesses.—2. Fractured Thumb—Inflamed Absorbents—Secondary Abscesses.—3. Cut Throat—Secondary Abscesses—Gangrene of the Arm.

IN my last accident week were admitted three cases of very different nature, which have all terminated fatally from an affection of the same kind. In one of these a woman had gone through what thousands of her sex experience—I was going to say—every hour, with impunity; but there took place in her, before her admission, an additional disease, of which she was obviously likely to die, when she came under our notice. The others were admitted with apparently trivial injuries, which ought usually to have got well without difficulty, but they have not been so fortunate; and the cause of death in all these has been one from which a great number of the deaths in the surgical wards arise, namely, the formation of what are called secondary abscesses. Its fatality makes the subject one of great interest, and I will bring it under your consideration to-day.

The first case is that of Elizabeth Collins, 29 years of age, who was admitted on the 8th of April, having a large and deep ulcer opposite the sacrum, from which a slough had come away, and which was feebly granulating. This, you will observe, is no more than may occur to any one with severe illness, and is only the effect of lying, and of this she would have recovered without difficulty. There was also a large abscess opposite the inferior angle of the left scapula, which was of a more formidable character, as we shall presently see. There was also great œdema of the left leg and thigh, and which was exceedingly painful, and the veins of this leg were tender on pressure; and there was some swelling of the right leg to a less extent. Her pulse was quick and weak, 96; tongue clean; much emaciation.

She was confined about a month ago, and had a very severe labour, and was confined to bed the whole of that time until her admission. As the illness was attended with some delirium no subsequent history could be obtained: she was, however, in good health previous to confinement. So say our notes, but I have since learned from Dr. Henry Davics that she had, as might be anticipated, the usual symptoms of uterine phlebitis, and as a consequence of this, she had swelling of the legs, which is called phlegmasia dolens, or phlegmasia alba dolens; the blood being unable to return through the obstructed veins, the overloaded vessels relieve themselves by pouring out serum, or serum mixed with lymph, producing more or less hardness of the swelled limb, and more or less pain, according to the degree of inflammation and tension present. Our patient, you observe, had some pain in the left leg, in which the swelling was greatest, but the other limb also was somewhat swelled, the return of blood by circuitous channels being not even yet fully established. The swelling arises, therefore, from a more mechanical cause,

and is very common after parturition or miscarriage, and its cause has been pointed out by many writers of late years, but yet it is occasionally overlooked. I lately attended a young lady, with Dr. Seymour and Dr. Ferguson, who twice had this swelling of one leg after miscarriage, but the nature of the affection had not been mentioned to her, and she had been allowed to walk about, and hang her leg down, while by elevating the leg so as to facilitate the return of venous blood from the extremity by its own gravity, with the application of four or five leeches to the groin, where the vein was painful, the swelling nearly disappeared in twenty-four hours. In our patient, also, you saw that rest alone was quite sufficient to remove the effusions into the cellular tissue.

But she had also an abscess in the back, which was of a more formidable character than the sloughing over the sacrum, or the swelled legs ; I opened it the day after her admission, and let out about a pint and a half of putrid pus. The patient at first improved a little in her general health, but on the 14th the notes say :—The abscess is discharging more healthy pus, and the ulcer on the sacrum is granulating ; the right leg is also much less swollen, but there is considerable swelling, with fluctuation in the right knee-joint ; in fact, a secondary abscess was forming of the same character as that of the back. On the 20th the knee was less painful, but a good deal swollen ; and in the left knee was also some slight pain ; but there were no perspiration or rigors. On the 23rd there was muco-purulent expectoration with a little cough. On the 24th the right knee was less painful, but more fluid was contained in it, and I punctured it with a grooved needle to ascertain the proportion of pus to the synovia, and finding that there was a good deal of the latter fluid I applied a blister to give what chance there was of absorption. It did not succeed, however, and on the 26th I opened the joint and let out half a pint of matter, with very little synovia now mixed with it ; this also gave no relief to the system ; she had profuse perspiration, and gradually got weaker till May 2nd, when she died.

On examination after death it was found that both lungs were slightly emphysematous anteriorly, but the other parts of these organs were healthy with the exception of the back part of both inferior lobes, which were congested, œdematous, and soft in texture, but still permeable to air. The heart was healthy ; fibrinous coagula were found in the right cavities only.

The abdomen, liver, spleen, and intestinal canal, presented nothing remarkable. The kidneys were somewhat larger than natural, and soft and coarse in structure ; their surfaces were perfectly smooth, but they presented numerous stellated veins ; they were very much congested, and their cortical structure was mottled, but the other parts were healthy. Uterus of a natural size, but of a darkish colour ; os uteri widely dilated, with congested lips ; mucous membrane of the uterus much congested, and covered in some places

with patches of lymph ; structure of this organ somewhat softer than natural, but no traces of inflammation were observed about the large venous sinuses. Right ovary healthy. Left ovary somewhat larger than natural, and containing a large cyst, apparently that of a corpus luteum, filled with thick creamy pus. Fallopian tubes healthy.

Lower part of vena cava inferior partially filled up by a firm light coloured coagulum, evidently of some standing. This coagulum was traced into the left common iliac vein, and it was found to confine a quantity of thick creamy pus, mixed with broken up coagula, the cavity of the vein being much contracted. The external and internal iliac veins, as well as the common femoral and its branches, which were examined, were all found on the left side filled with large firm coagula of a very light colour, blocking up their cavities, and partially adherent to their internal walls.

The cavity of the right knee-joint contained a large quantity of foul pus, and an incision was found on the outer side of the articulation ; which I had made in fact. All the tissues of the knee, as well as those in the immediate neighbourhood, were of a dark grey colour. The synovial membrane was extensively destroyed, as well as the cartilages, and in some places the articular lamella of the bone was destroyed, and the cancellous structure laid bare.

Here, then, you have an instance of unhealthy inflammation of the uterus after confinement, the evidence of which still existed in the condition of the uterus and ovary, and probably the interior of the cavity was at first quite sloughy where the placenta separated from it ; this occasioned inflammation of the internal iliac veins, which spread as far as the vena cava, and downwards in the groin and thigh through the branches of the external iliac and femoral veins ; the secretions of the inflamed vessels, which were morbid and poisonous, passed into the circulation, and affected the whole system, so as to occasion remote parts to inflame and suppurate in a secondary manner, as you have secondary symptoms from the poison of syphilis.

It is said by some pathologists that secondary deposits always arise from phlebitis ; sometimes of the small veins only, at other times, as in this woman, of the larger trunks also ; I am not myself, however, inclined to believe in the universal existence of phlebitis in such cases, though it is certainly the most common mode in which the poison passes into the circulation. Many years ago, when my colleague, Dr. Lee, was investigating this subject in reference to such cases as our present patients, I gave him the particulars of a case in which a woman died after confinement in the hospital, which took place prematurely while she was under my care for another disease. In this patient, besides the sloughy uterine surface and inflamed structure of that organ, I found an immense number of the absorbents full of pus quite up to the receptaculum chyli, which itself contained some of this secretion. The

absorbent system, therefore, I believe is sometimes the channel by which the poison is conveyed, instead of the veins, and you have seen an example of it in the second of our cases, namely, that of William Wynn, æt. 62, who was admitted on the 12th of April.

Just before last Christmas he fractured the first phalanx of his right thumb by a blow from a piece of wood, but not knowing it at the time, he continued to work with it for the rest of the day, the consequence of which was that it inflamed, and an abscess formed, making the fracture a compound one ; and it has continued to discharge ever since, some small pieces of bone having come away from time to time, the last piece having escaped about a month ago. He came in with some expectation of losing his thumb, but this is too valuable to be lightly taken away, and there was no reason why it might not be saved in such a case, for it was already becoming firm, and would have been very useful after all the bone came away, though somewhat shortened. As it has happened, indeed, it might have been better for him if I had amputated the thumb, though even then, perhaps, the secondary symptoms might have occurred ; it might have been better also if I had sent him into the country again, which I should have done at once, had he not come from a great distance, so that I thought it better to endeavour to get the dead bone away if it loosened shortly. A small piece did come away on the 15th, and on the 24th the notes say, that the thumb was less painful, and that there was very little discharge.

He complained at this time of pain in the bladder, which extended down the penis, and was particularly severe at the glans : he made water frequently, and had pain in the loins, and in the left testis. I passed a prostatic catheter without much difficulty into the bladder, and found the prostate gland was not much enlarged : the urine drawn off was acid, and contained some pus. Now this affection of the urinary organs we shall have to return to presently ; but of course the irritation of such a disease could not fail to impair his general health, and it appeared also that he had been subject to rheumatism.

In the evening of the 2nd of May he had a rigor, followed by fever, and the next day the note is this :—Increased pain and redness of the thumb, and of the index finger of the same hand ; redness in the course of the absorbents, and pain in the axilla : fever. So far this was no more than might be seen in any common attack of inflamed absorbent vessels, which is often ushered in by a shivering fit, and yet is not attended with much risk ; and, in fact, on the 7th, the notes say :—*Right* arm seems a good deal improved ; but it is added, there is a good deal of pain in the *left* arm, especially about the elbow. This was not complained of, as it was regarded by himself and the nurse as an attack of the rheumatism to which he was subject, but on seeing him the next day, I found that he was in fact almost dying. There

was less redness and inflammation of the right arm, but some fluctuation was found on the back of the wrist, which was opened and some pus evacuated. There was more pain and swelling of the left elbow, and on looking at it, it was evidently too much swelled, and with too much effusion around it, and too painful to be rheumatic; and it was really a secondary abscess thus suddenly formed. He had also an exceedingly anxious and depressed countenance, and he had been delirious at times in the preceding night; he had very great perspiration, and much fever, and had incontinence of urine and fæces, and he gradually sank till his death at half-past two on the following morning, the 9th.

On examination there was found some bloody fluid in both pleuræ, apparently from exudation after death; the lower lobe of the right lung was congested, and rather softened; and the left one was in the same condition at the inferior and back part. There was bloody fluid in the pericardium from exudation after death; heart flabby; left ventricle dilated with thin walls; small specks of atheromatous matter on the aorta; blood quite fluid in all the cavities.

Liver healthy. Kidneys much softened from decomposition, but the left appeared otherwise diseased, as if the cortical structure had been a good deal absorbed. Spleen soft. Bladder contained some turbid urine, and its mucous membrane was slightly rugous.

A small wound communicating with exposed bone was seen over the first phalanx of the right thumb; the greatest portion of the first phalanx was destroyed, and a small portion of it was in the wound: the head of the corresponding metacarpal bone was quite destroyed, and covered with lymph. The right wrist-joint was filled with pus, and the articular surfaces of bone much absorbed. The left elbow-joint contained a small quantity of pus; the head of the radius and corresponding articular surface of the humerus having their cartilages much absorbed: a large quantity of pus was found infiltrated in the substance of the brachialis anticus muscle. Now all this suppuration and the abscess in the wrist were the effect of absorption of pus, and probably through the lymphatic vessels.

Our third case is remarkable for a further effect of the poison, namely, the occurrence of gangrene along with secondary abscesses.

Henry Isaacs, 42 years of age, was admitted April 14th, with a small wound, inflicted by himself, immediately opposite the thyroid cartilage, no air coming out of the wound, and there being no hæmorrhage from it.

He was admitted under Mr. Cutler with a similar injury, and has only been discharged from the hospital about a fortnight. He is a great drunkard, and is at times insane.

Now this was a trivial wound, which was in itself free from danger, and on the 16th the wound was partially united by the first intention. On the 17th

he had a moderate attack of fever, without rigor, but with a little sore throat, and the wound was not so healthy, and there was a little inflammation around it, which had subsided again by the 20th. But on this day, the 20th, it is noted, there is some redness and swelling of the extensor side of the right forearm at the upper part, not circumscribed. He is very restless, but has had no rigors; he complains of pain in the right side of the chest, and a little cough; and he had more fever, and in the evening he was restless and delirious. The next day, the 21st, there was in the morning considerable swelling and a peculiar brawny sensation of the forearm, extending partially up the arm; and by the time I saw him in the middle of the day, the whole extremity, nearly up to the shoulder, was dark coloured and cold, and in a state of gangrene, and he had a secondary inflammation on the radial side of the left forearm, and the wound of the throat was sloughy, and some air was passing out of it. He was breathing with much difficulty, and shortly, and with pain on both sides of the chest; he was haggard and delirious, and bathed in perspiration, and died at half-past eleven the same night, scarcely thirty-six hours from the first evidence of danger.

No marked morbid appearance was observed in the brain or its membranes. The skin of the neck was extensively discoloured, and in the region of the thyroid cartilage was a small wound penetrating through the cartilage immediately between the superior and inferior chordæ vocales. The mucous membrane of the larynx was congested, and the submucous cellular tissue, both of the aryteno-epiglottic and of the glosso-epiglottic ligaments, much thickened by an effusion of serum and lymph: the mucous membrane of the trachea was also congested.

The cavity of the right pleura contained a small quantity of dark-coloured fluid mixed with flakes of lymph and puriform fluid. The lung itself was compressed, but otherwise healthy; left lung congested posteriorly. Heart and large vessels healthy. Coagula for the greater part fibrinous in all the cavities of this organ.

The viscera contained in the cavity of the abdomen presented nothing remarkable with the exception of the kidneys, which were large and coarse in structure.

The right arm was very much swollen, with great discolouration of the skin, and large vesications in various parts. Serum, and a small quantity of lymph, was found in the subcutaneous cellular tissue, which was of a very dark colour. This discolouration extended even to the muscles and cellular tissue under the fascia. A similar appearance was found on the outer side of the left forearm, but it was confined to this part.

You will have observed in this case that the two arms had a secondary abscess in exactly the same situation in each, while there was none elsewhere, which presents you with an instance of what has been called

symmetry in disease; that is, two or more parts are altered in structure exactly in the same manner on the opposite sides of the body, just as the two hands or great toes resemble one another naturally. Some attention has been drawn to this subject of late, both in this country and on the Continent, but I must confess that although you do see the fact sometimes, yet the exceptions seem very much more numerous than the examples of the supposed rule. You saw it remarkably in this man, but there was no such circumstance in either of the two other cases.

You saw again in this man that there was an affection of the urinary organs, but in all three it was perceived on examination that there was alteration of structure of the kidneys; and you will find that this is the case very often indeed in those who die of secondary abscesses, evidence of it being sometimes given before death by the presence of albumen or pus in the water. The most extensive case of gangrene, with secondary abscesses, which I have ever seen, was in a man from whom I removed a cancer of the lip, and who had laboured, without my being aware of it, under diabetes for a long time. The wound healed readily in this man, but there was a little suppuration in the places made by the sutures, and a gland suppurated in consequence of the irritation which they produced; he was attacked with a secondary abscess in the left knee and thigh, and in the right thigh and ankle, and in the muscles of the limbs, and then mortification took place the day before his death in the whole of the right leg and thigh, as suddenly as in our patient Isaacs.

Unquestionably persons broken down by intemperance, with disease of the kidneys and heart, are predisposed to that form of inflammation in which the poisonous secretion is generated. So are those who are lowered by any cause, such as flooding in our first patient, perhaps, or the mania of the last, or anything else which depresses the vital powers. Still, however, they will take place sometimes without any apparent cause of this kind, and may therefore occur at all ages, though adults are certainly most likely to have them under such circumstances as I have described. A very rapid case took place in a boy, only four years and a half old, who was under my care for a burn of the body, and who died as early as the 9th day after the accident, with commencing abscess in one knee and one elbow-joint. Certainly atmospheric changes have much influence on the production of these abscesses, as they have on cellular inflammation, erysipelas, inflammation of the throat and other unhealthy and diffuse inflammations, and therefore you will sometimes see these diseases with deposits of pus in distant parts very prevalent for a time, as they have been this spring, in consequence, perhaps, of the mildness of the winter, which has given a lower type to many disorders; while at another time many months will elapse without your seeing an instance of the disease.

You see, further, that the local condition, on which the secondary abscesses depend may be very dissimilar ; an inflamed uterus, a small recent wound, a little sinus leading to dead bone of small extent, erysipelas, a burn ; in fact, anything in which suppuration is going on.

It is sometimes supposed that they only arise from suppurating surfaces communicating with the air, or from inflamed veins, with purulent secretion ; but they often take place when there is no wound at all, as from a foul abscess unopened : for example, a girl died under my care who had been struck on one hip, so as to cause an acute abscess of the joint, with suppuration even on the pelvic side also of the innominatum. She suffered most acute pain everywhere, but especially about the heart ; and I found several secondary deposits in the substance of the heart itself, besides suppuration in the pericardium, both pleuræ, and the peritoneum, and an external abscess of the surface of the chest.

There can be no doubt, in my opinion, that these secondary abscesses depend on the introduction of a poison into the blood, which is generated in the morbid secretions of pus and lymph in the inflamed parts, of whatever structure they may be ; and as a proof of it, you can therefore often see the pus in the veins and absorbent vessels in its course into the general circulation ; and you can see the pus in the blood itself, even with the naked eye, in many instances, if you examine the centre of the coagula in the heart and larger veins, and you have evidence of the morbid condition of the blood very frequently while the patient is still alive. A young man, of about 19, was under my care, two years ago for a compound fracture of the leg, who died three weeks afterwards of this disease, and a remarkably dark colour of the body demonstrated the morbid condition of the blood, which affected even the urine, giving it a dark colour with cloudy deposit of mucus, and tinging the matters vomited as if some of the colouring of the blood escaped. Let me read you the notes of the post-mortem examination.

Body of a peculiar yellowish-brown colour ; pleuræ and lungs healthy in structure, but the latter organs were of a peculiar brown colour, as if steeped in sepia (Indian ink) and water. Pericardium and heart healthy, of the same colour as the lungs ; the blood in the cavities partly fluid, resembling weak coffee in appearance, partly coagulated, the coagula being of a dirty yellow colour. All the viscera of the abdomen presented the same peculiar colour before mentioned. Kidneys large, healthy in structure. The liver presented several small abscesses at the inferior part of the left lobe, the pus being of the usual colour and consistence. Spleen three times its natural size ; solid, and easily lacerable. The blood in the inferior cava and in the iliac veins of the same colour as in the heart ; so was also that in the femoral vein, the branches in the neighbourhood of the fracture presenting nothing remarkable. All the venous blood contained pus globules, visible to the naked eye, as well

as in the microscope, while that in the arterics and left side of the heart contained none.

The colour of the skin in this and in similar cases arises from the altered quality of the blood, and it often resembles jaundice, and sometimes no doubt jaundice does actually arise from the inflammation and secondary abscesses in the liver, which, as you perceive in these drawings, may pervade every part of this organ, and make it of immense size ; but that the colour does not generally depend on bile is evident from its being present in a marked degree not only when the abscesses are very small, as in the case I have just related but even when the liver is entirely free from any inflammation whatever, while on the other hand you will in other cases perceive little or no discolouration of the skin, when the liver is universally affected with secondary deposits.

Taking it, then, for granted, that secondary abscesses arise from a peculiar poison being introduced into the system, in what way, let us next inquire, does it exert its fatal influence ?

Now they have been called secondary deposits of pus, from the very erroneous opinion that the pus enters the blood at any inflamed part, and is simply deposited again in one or more distant organs or tissues ; an explanation founded on the old humoral pathology of metastasis. Were this hypothesis true, they ought to be most numerous and extensive when the quantity of suppuration is greatest ; but the danger is often really greatest, when the secreted poisonous matter is very small in quantity, as in the patient with cut throat. A man had the humeral artery tied by one of my colleagues for an aneurism of the ulnar artery, and one of the small venæ comites was tied with it, the secretion from which (being inflamed) was scarcely more than a few drops, but its virulence was such that the man died in about three or four days from its effects on the general system ; it was fatal, in fact, before there was any time for local effects to be produced by it ; just as the poison of scarlet fever is sometimes fatal before there is any eruption. This appears to me then to be much too mechanical an hypothesis to be true.

Another opinion has been given by Cruveilhier, and other modern pathologists, founded on the experiment of introducing mercury into the circulation, the effect of which has been found to be that the globules of metal have been discovered, each of them forming the nucleus of a small abscess, round the place where they have been retarded in their course. In the same manner it has been supposed that the pus globules, which are larger than those of the blood, may be obstructed in the capillaries, and occasion surrounding inflammation ; in the lungs of course generally, if the pus is in the general circulation, and in the liver if it is in the portal veins. Now here, again, we are met by the fact that the most numerous and extensive secondary abscesses often take place where the primary suppuration is very

small, looking as if they depended on the intensity of the poison rather than its quantity ; one would expect that a globule or two of pus blocking up a capillary would excite a suppurative inflammation around them only ; and not occasion universal gangrene of an extremity in a few hours, as in the two cases I have narrated. It was long known that injuries of the head were sometimes followed by abscesses of the liver ; but according to the theory in question abscesses in that organ should rather occur from suppuration in the parts from which the portal veins arise, while those caused by injuries of the head should generally take place in the lungs, as the pus would have to circulate there long before it could reach the liver.

When my immediate predecessor, Mr. Rose, described secondary abscesses as often being produced in the lungs by injuries of the head or compound fractures, or other injuries, the surgeons in London were inclined to be incredulous on the point, though long familiar to us all in this place, and they called it the St. George's disease ; but it gradually came to be acknowledged that secondary abscesses may take place in every organ and tissue of the body, and not in the liver or in the lungs only.

I do not wish to deny that secondary abscesses may sometimes arise from globules of pus retarded in their passage through some of the capillary vessels, but I cannot think that this mechanical explanation will apply universally or even generally ; it is much more probable, I think, that the manner in which the poisonous secretion acts is by causing a change in the nature of the blood, immediately indicated by rigors or fever, or other evidence of its influence ; it alters and works up this fluid, and gives it a tendency to induce inflammation in various parts.

If you take a drop, I may say half a drop, of pus on a lancet out of a small-pox pustule, you know that the consequence may be thousands of distant inflammations, with suppuration ; secondary abscesses, in fact, succeeding in a few days to the introduction of the poison into the blood ;—now no one would here attribute the inflammation, if there was only one pustule, to this half drop of pus being deposited again, nor to its being retarded in a capillary vessel ; still less could such numerous little abscesses be accounted for on either supposition.

Again, take a drop of pus from a chancre, and inoculate any person with it, and then heal the sore you have produced ; yet you know that after a much longer period, that is four or six weeks, the blood will have become so poisoned and altered that inflammation may ensue in an immense number of different parts, and that it will even affect the offspring of a person so circumstanced ; but you do not resort to the hypotheses before mentioned to account for these effects.

Another animal poison, that of a venomous serpent, gives you an example of the contamination in a very few minutes of the whole blood of the system,

by a very minute quantity of liquid ; or if you arrest its entrance beyond the bitten limb, so as to prevent its being fatal, you will see the arm become quickly dark coloured from the alteration of the blood, and then gangrenous, as in our cut-throat patient, or if it does not entirely die, there may be extensive suppuration and cellular inflammation, and sloughing.

In the same manner as in these several cases I would account for the effects of the introduction of the animal poison generated in unhealthy local inflammations. Instead, therefore, of the lungs or the liver being almost always the seat of secondary abscesses, according to the respective locality of the primary suppuration, you will witness a curious kind of fashion with regard to them. It is true that they very often take place in the lungs, as you might expect, since the whole of the blood has to circulate through this organ, yet sometimes you will see none whatever in the lungs for a considerable time, while there are many in the liver ;—our three patients have had no abscesses, you observe, in either lungs or liver, but they have had them in the cellular tissue and muscles and joints, and so have other patients lately ; in another epidemic you will see a great number of cases of effusion into the serous membranes, and not a single instance of suppuration in the extremities or external parts of the body.

The secretions being in such cases as we are considering, of a poisonous nature, you would naturally inquire whether it is not contagious to another person, as well as capable of contaminating the blood of the patient himself ; and so in fact it is, provided, as with other poisons, the recipient be in a fit state to be acted on by it. It has very long been known that puerperal fever, such as our first patient had, may be conveyed by the hands from one woman to another : and a conscientious accoucheur, who has a patient with this disease, will not attend others till he thinks contagion is destroyed. So the matter of an ordinary foul abscess will give puerperal fever, if it is carried ; and the poisonous and fatal influence of the secretions of serous membranes has been too often experienced by members of our profession ; many a nurse and washerwoman, as well as the medical attendants of patients, have proved the contagious quality of the secretions of wounds and abscesses, sometimes by the production of a fatal effect independent of local inflammation, sometimes by local effects only, erysipelas, or cellular inflammation, or inflamed lymphatics ; sometimes by the further evidence of secondary abscesses. You cannot, then, be too cautious when you are concerned with such foul suppurations, whatever their origin, not to propagate the disease ; I am not at all sure that the contagion is not sometimes conveyed, and the disease propagated, by sponges used indiscriminately in our wards : it is true that the nurses have orders on the subject, and ought not to use them with healthy wounds after they have been employed on unhealthy ones, but we well know how careless all are apt to become. I do

not mean, indeed, that contagion is likely to be the common cause of so many suffering at certain times from foul suppuration and secondary abscesses; the cases are obviously too scattered in different wards, not to have a general cause in operation, and this obviously an atmospheric cause, making, as I have already said, all the forms of low and diffuse inflammations epidemic, both in hospitals and in private, at certain intervals of time.

Infection, also, has been sometimes believed to exist with regard to these cases, and accoucheurs have burnt their clothes, lest they should convey the poison of puerperal fever. I do not know, however, that there is any proof that the unhealthy pus, which produces secondary abscesses, does actually contaminate the atmosphere, though doubtless (as with typhus fever), the accumulation of the effluvia by many persons being collected together, and the apartment not being ventilated, might easily generate an unhealthy atmosphere, which would alter the system of those exposed to it, and make the inflammation of their wounds and injuries unhealthy and dangerous, which in purer air would not be so.

You observe I speak of the poisonous effects of the purulent secretions of *unhealthy* inflammation, and it is only in such that pus is poisonous; it is the mixture especially of pus and lymph, when the inflammation is unhealthy, which causes the absorption of matter to be so dangerous. Healthy pus produces no such effects, and large abscesses may be absorbed without mischief, if they are of this character. It is denied, indeed, sometimes, that true pus is ever absorbed; and it has been asserted that the fluid supposed to be purulent, has been, in reality, of a serous quality; but I have myself no doubt of the fact, from the test of a grooved needle.

You have seen all these three cases terminate fatally; and undoubtedly secondary abscesses, and the state of blood which occasions their formation, are exceedingly dangerous, but yet I have known a good many recover from this condition; you are not, therefore, to give up the cases in despair, as so many appear to do, but you must endeavour to relieve the system from the poison. I have no doubt, indeed, that very many recover after the purulent secretions have entered the circulation, but not in sufficient quantity or intensity to occasion secondary inflammation. I wish to prove to you, however, that even after local inflammation has been established, and abscesses have formed, patients will sometimes get well. A young man came under my care who had his foot and ankle crushed by a railway carriage upon the rail; the ankle-joint, however, not being opened, though some smaller ones were, and no bone being broken, I endeavoured to save the leg, which was eventually managed, although so much skin was destroyed by sloughing that I hardly thought it possible the cicatrix could have remained sound, as it has done, for above two years. This patient had very

great fever, with foul suppuration, and on the seventh day a secondary abscess formed, of not less than seven inches length, along one forearm, in the same situation as in Isaacs, which I opened, and which quickly healed.

A lad came into the hospital with a punctured wound of the knee-joint, of which he was nearly dying, from the immense suppuration in the leg and thigh which took place, and which was attended with much hæmorrhage; he got well, however, in time, with ankylosis of the joint. This lad, besides a large secondary abscess of the back, and a small one of one thumb, had also one of considerable size within the pelvis, in front of the bladder, which I opened by an incision through the linea alba.

Nor is it only with secondary abscesses in cellular tissue, but even in such cases as have inflammation in the viscera, recovery may take place. A gentleman whose thigh I amputated for immense abscesses from disease of the knee-joint, had the usual rigors and perspiration, and fever which attended the absorption of pus, with apparent inflammation of the liver; but he recovered, as I have seen several others do, when this organ has been affected short of actual suppuration; and the same may be said of secondary inflammation of the lungs.

A man was under my care, two years ago, with very large suppuration among the muscles of the thigh, from its having been run over; and in him the same congestion of the lungs took place which you have seen in all our present cases, especially in the left, which scarcely admitted any air whatever for a time; it was relieved, however, by expectoration of blood and mucus to some extent, and he left the hospital quite recovered. I operated upon a lady for strangulated umbilical hernia, and having reduced the intestine I left the omentum in the wound, which afterwards sloughed away with some of the skin, and of course with foul suppuration. This lady was very near dying, but was saved by a large quantity of foul putrid pus being suddenly discharged from the left lung, by which she was at the time exceedingly oppressed, and for several days nearly a pint of pus and mucus was brought up; a second time the same thing took place, either from the blocking up of this one, or the bursting of a second abscess of the same lung. Dr. Seymour attended this patient with me, and she was also seen by Sir Benjamin Brodie, who assisted me in the operation; and no doubt was entertained by either of us that she had had one or more secondary abscesses of the lung in consequence of the sloughing and unhealthy suppuration of the omentum.

And what is the treatment by which you may hope to carry your patients sometimes through this dangerous condition of system? I do not, in fact, believe that there is any peculiar line of practice. I have tried some specific remedies, with a view of introducing them into the blood, such as various salts, among them the chlorate of potash, recommended for gangrene of the

mouth, and I have seen some patients get well who have used it ; I have tried, also turpentine, which readily acts on the blood, and has done good in some membranous inflammations, but I do not know that they have done any peculiar good. I think you will certainly derive benefit sometimes from the use of small quantities of calomel and opium, sometimes two or three times a day, sometimes in a larger dose occasionally at bed time ; this remedy inducing, as you know, a remarkable influence on the capillaries in inflammation, and probably affecting also the quality of the blood. When there are rigors, saline remedies with Dover's powder may be given ; if there is excitement, nitre and antimony : where there is copious perspiration these medicines would obviously be improper ; but ammonia, wine, porter, or spirit may be required, proportioned to the condition of your patient. The common principles of treatment in irritative or low fever will guide you in adapting your remedies to the several cases, rather than any specific practice.

Locally you will occasionally do good by a few leeches or cupping, as over the liver or a joint, but they are of little power, and very little depletion can ever be employed without doing harm. Mustard poultices and blisters have great efficacy when the liver or lungs are affected with secondary inflammation and sometimes, though not often, when the joints are inflamed. And of course you must open the abscesses when you discover them.

[*Medical Gazette*, vol. ii., new series, p. 933, May 29, 1846.]

DISEASE OF THE ELBOW-JOINT, & SECONDARY INFLAMMATION FOLLOWING A BURN.

THE patient, a man about 45 years of age, fell from a ladder against a stove, and being probably stunned by the fall, his elbow rested against the door long enough to burn the parts over the olecranon in a very unusual degree, so that, when admitted into St. George's Hospital five weeks afterwards, the slough still adhered to the periosteum of the bone, which was laid bare, and hence the rare circumstance of the burn having occasioned the entire destruction of the joint. There was much cellular inflammation of the arm, which subsided after incision, having the characteristic swelling around the diseased elbow-joint ; he was weak, but without any rigor or perspiration indicative of the absorption of matter, which was nevertheless shown by the occurrence of the yellow complexion of this poison, by pain in the left pleura and peritoneum to a slight extent, a few days after his admission, and by the prostration which similar affections of the peritoneum produce, and he died nine days after he came into the hospital, the mildness of the constitutional symptoms depending probably on the small quantity of poison which had entered the blood.

There was a small quantity of serum in each pleura, with masses of recent

lymph at the lower part of the left one, and the left lung was inflamed and altered by purulent secretions, so as to present the usual appearance of gray hepatization; a portion of the uninflamed right lung was brought to show the contrast between the two sides. There was also a small quantity of serum in the pericardium. The pelvic portions of the peritoneum contained a considerable amount of solid lymph, part of which was filled with serum, giving it a gelatinous appearance: the rest of the peritoneum was scarcely more vascular than natural.

Some of the superficial veins of the arm were obliterated by the inflammation, and some portions of the muscles and other soft parts around the elbow were shown nearly gangrenous around the vessels and nerves: abscesses led in several directions through the joint, which was exhibited, having scarcely a vestige of cartilage on either of the bones, which enter into its formation.

[*Pathol. Trans.*, vol. iii., p. 175, March 18th, 1851.]

CASE OF RECOVERY AFTER UTERINE PHLEBITIS AND SECONDARY ABSCESES.

THERE is a case in the hospital forming a very good example of the state a patient may be left in after phlebitis of this nature, and it is worth looking at, as it is an instance of recovery from the disease, which is a rare circumstance, when it has gone to the extent that this has done. Elizabeth Dawson, æt. 41, was admitted into Hudson Ward on June 2nd with, as the notes tell us, enlargement of the femur, partial ankylosis of the patella to the tibia and femur; pain on pressure of the patella; no pain on pressing together the articular surfaces of the tibia and femur. There is a small opening above the joint discharging synovia, which can be pressed out, and a large cavity extending three or four inches up the thigh, apparently full of synovia. In fact, the joint is no doubt completely disorganized; and although perfect ankylosis has not at present taken place, it must do so, if she is to get well. When she was admitted, there was an opening connected with the joint, and with an abscess extending some way up the thigh under the vastus internus. This has since closed. There is another opening now existing in the ham, and this is no doubt also connected with the joint. She has besides phthisical symptoms, but they have no connection with the point we are now considering.

The history she gives is as follows:—she was confined six months ago. Four days afterwards she had great pain and tenderness over the uterus, lasting for a week, and relieved by fomentations. The usual discharge ceased. The knee soon began to swell, and there is some obscure history of a fall out of bed six weeks after her confinement. Abscesses formed, skin-deep, on the back of the left hand and shoulders, about the same time with

the swelling of the knee. The whole leg was much enlarged while the knee was swollen. She had very severe darting pain in the knee, with starting of the limb at night. The abscess in the knee burst two months ago, and discharged purulent matter for six or seven weeks, and has been discharging synovia since. Here there is a very clear history of inflammation of the uterus after delivery, followed, in six weeks, by abscess of the knee-joint, and secondary abscesses in other parts of the body. She may retain her life, but at the expense of an anchylosed joint, and the phthisis makes even this doubtful. By far the greater number of these cases of phlebitis and secondary abscesses are fatal. I have, therefore, directed your attention to it as a rare instance of recovery. [The patient has since left the hospital well.]

[*Medical Gazette*, vol. v., new series, p. 498, June 22nd, 1847.]

CLINICAL LECTURE

ON

SECONDARY AND FÆCAL ABSCESSSES.

1. Secondary Abscesses of Joints and other parts following Parturition.—2. Primary Abscess in the Iliac Fossa following Parturition—Fæcal Abscess.—3. Artificial Anus after Injury chronic and acute.—4. Collections of Fæces and Abscess after Ulceration of Colon and Cæcum.—5. Discharge of Fæces with Urine.—6. Calculus in Kidney resembling Fæces in the Cæcum.—7. Kidney resembling Tumour of Liver, with Fæcal Abscess.

1. THE first subject which I am going to bring under your notice to-day, is that of a very interesting case of secondary abscesses after parturition, which has been very rapid and severe. It is the case of a young woman, Clara Watts, 22 years of age, who was admitted Feb. 17th, three weeks after her confinement, which is said to have been a hard one at the full period. Immediately afterwards she had very severe pains in the lower part of the abdomen, which was very tender to the touch; she had severe rigors, both during and after her confinement, in which she was attended by a midwife, and was delirious some part of the time. Her right leg and foot began to swell a week afterwards; it was very painful, especially about the ankle-joint. Her right arm and hand began to swell a week after the leg, that is, a fortnight after the labour, the wrist and finger-joints being chiefly affected; the left arm also began to swell within the last week, and she has had some cough for the same time.

On her admission she was very thin and weak; her pulse was weak, and very quick, and her manner very hurried and anxious; her tongue was clean, but red and dry, from the irritation she laboured under. She had had very little sleep at night, and she complained much of pain in the back, having a bad slough on the sacrum. An abscess required immediate opening over the joint between the first phalanx and metacarpal bone of the middle finger of

the right hand, and another with sloughy fascia and cellular tissue two or three inches long, on the back of the same arm, as if following the extensor tendon. I also opened an abscess over the back of the wrist of the left hand, several of the joints being very painful, and red and swelled. Her right leg was a little swelled, and painful, particularly about the ankle, and there was a good deal of redness round a large dry slough, which covered almost the whole of the dorsum of the foot. There was also some redness and swelling on both sides of the left ankle-joint, and the least motion of either foot gave her much pain, as if both ankle-joints were affected; and besides all this, there was slight pain, tenderness, and swelling of the left knee-joint. Her right leg and both arms were extensively marked by caustic, which had been applied on the supposition of her having erysipelas, but it was abundantly clear that she was suffering under that secondary form of inflammation which so often follows the absorption of matter, and which produced, in her, the gangrenous inflammation I have described of the right foot, as well as numerous abscesses, or threatened abscesses. In short, a morbid poison was circulating in her blood, which had entered the circulation from inflammation of the uterus, and of the veins or cellular tissue about it, which poison you so often see generated after accidents or erysipelas, or with any foul suppuration. You will do well to read a little work recently published by our former house-surgeon, Mr. Henry Lee, giving an account of the various facts connected with this dangerous condition, who has added to what was known on the subject, some very simple experiments made by mixing pus with the blood, showing its immediate effect upon this fluid, and showing also, how the mixture, in this state, may carry poison to all parts of the system. I have often seen pus mixed in considerable quantity with the coagula contained in the cavities of the heart and great vessels, in those who have died of secondary abscesses, or of the fever preceding their formation, so that it is no wonder that inflammation should be set up in any part of the body to which the poison is conveyed, and no wonder, also, when it is so extensive as in this patient, that its fatality is very great.

Now as to the treatment of this case during the few days she has been in the hospital:—For the slough on the back she was directly placed on a water bed, and endeavours made to change her position, to relieve her from pressure; this sore I need not say, adds materially to her danger, and though it is not the immediate result of the poison, like the abscesses, yet it probably would not have happened but for the fever occasioned by the poison. Locally, besides opening several abscesses, as you saw, on the day of her admission, I have since had to open another on the left arm in front of the radius, and another on the outside of the left ankle, from which synovia also appeared to escape; this, however, has since healed up, and the inflammation around the joint is lessened. The house-surgeon has also opened another fresh abscess

about the left scapula, and more of them may yet form. Regarding the constitutional treatment, you have seen that I ordered an opiate every night, which is of great use in husbanding the strength. I first ordered, also, with the acetate of ammonia mixture, appropriate to her flushed and feverish state, a little bark; this she did not bear, and the saline with excess of ammonia was substituted for it; but I am again trying some tincture of bark, and camphor and ammonia, as the tongue has become more moist; and with these medicines she has from the first taken some wine, now half-a-pint, and two pints of porter, eggs, meat, and any nourishment she appears capable of taking; in fact, however, very little solid food, either bread or meat, has been taken yet, and her eggs and wine and porter have chiefly sustained her. It is, I believe, on these principles that you must treat these cases, endeavouring to carry the patient gently through the period of fever and exhaustion by simple remedies, with support corresponding with the degree of depression present in each case. I have tried various remedies of more power, such as calomel and opium, which suggests itself as the proper means of subduing extensive capillary disease; and chlorate of potash, which is very useful in a not dissimilar condition, that of sloughing phagedæna; also turpentine, and other medicines; but they all seem to be of little avail; the patient's own powers and the amount of poison, seem to be of more importance than specific or powerful remedies. You have seen this woman suffering very much at first, and on the fourth day she appeared sinking, and incapable of recovery; but yesterday she certainly seemed better, and to-day is considerably improved, so that I do not despair of her recovery. Her life or death must depend on two circumstances: the extent of affection of the lungs, and the condition of her knee-joint; for I need not say that secondary inflammation of an internal viscus, and an abscess in a large joint, must be infinitely more hazardous than any amount of suppuration in other parts. I am inclined to believe that there has yet been only congestion of the lungs, with a little pleurisy, so that the cough she now has, and which is rather better to-day, may indicate a condition which will stop short of suppuration. Even in the lungs, however, I have known patients recover, with such an amount of congestion as to bring up blood; and I have seen even foul abscesses evacuated from the lungs, and yet not prove ultimately fatal.

The condition of her knee-joint is interesting: there is formed, in the secondary inflammation of a joint, sometimes pure thick pus, and sometimes a mixture of a variable quantity of pus with synovia; and of course the greater the proportion of synovia, the more chance there is of absorption of the fluid, and of the patient's recovery. You will have observed the rapidity of the disease of the knee-joint; the slight swelling and tenderness of the 17th, the day of her admission, is changed on the 19th, so that the notes say the knee-joint is rapidly filling with pus, slightly red, and exquisitely tender

and painful on the least motion or touch of the part, and I began to consider the propriety of opening it, but did not do so on that day. The pain in these cases is sometimes nearly absent, but in others is very great, there being ulceration of the cartilages, as well as inflammation of the synovial membrane.

On the 22nd the knee-joint was less tense, and the pain less, but there was some fulness and swelling of the lower part of the thigh; the fluid, in fact, had ulcerated through the synovial membrane into the space below the vasti. If then it had been a perfect abscess in the joint, the case would only have been worse; the pus would not be absorbed, and notwithstanding the apparent amendment of the joint, there would have been an extensive abscess occupying the greater part of the thigh, and when evacuated there would still have been a communication with the joint. If, on the other hand, it consisted in good measure of synovia, the fluid would much more easily be absorbed in the cellular tissue of the thigh, than if confined within the synovial cavity. Yesterday, the 24th, the joint became smaller, but not so the lower half of the thigh; to-day, however, I cannot help thinking that there is less fulness of both parts,—the joint is indeed quite flaccid,—and consequently that there may perhaps be no necessity for opening the joint.

That recovery, after such a state as this patient is in, is by no means impossible, is proved by some rare but fortunate cases every now and then. Many of you may remember a woman, about two years ago, under my care, with a large abscess in the loins, and one in the shoulder-joint, which left only some stiffness from adhesions of the deltoid and biceps muscles, occurring, like Watts's, after confinement; and about three years ago was another case, from the same cause, still more like our present patient's, as she was admitted after secondary abscesses of the hand and shoulder-joint had got well, with cough still remaining, and with an abscess of one knee-joint discharging some way up the thigh. She suffered a good deal from the ulceration of the cartilages, which was still going on, but before she left the hospital the abscess had closed, the health was restored, and the limb useful, though with ankylosis of the knee-joint.

[The amendment noticed in the lecture continued till the 1st of March, when a rigor took place, which Mr. Hawkins attributed to fresh absorption of pus, and a fresh abscess formed in the arm and leg; acute pain was complained of in the back of the left shoulder, with more cough and rapidity of breathing; a foul abscess formed in the calf of the right leg, and the knee and ankle joints all inflamed again. She became gradually weaker, and died on the 4th. The following appearances were observed on examination after death, in addition to what has been mentioned in the lecture:—

The left knee-joint contained a large quantity of darkish looking purulent matter, and at the inner side was an opening, which communicated with a long, sinuous abscess, reaching as far as the upper third of the thigh, under the

muscles. In both ankle-joints was purulent matter, without much indication of inflammation ; the cartilages were absorbed, except at the most prominent part of the astragalus, where they gradually thinned off till they were lost ; in one or two spots the bone presented vascular patches. The left wrist-joint contained purulent fluid, and the bones were denuded of their cartilage. The right knee and wrist-joints were unaffected. In the left pleural cavity were three or four ounces of a clear fluid, and on the visceral layer of the pleura were some shreds of recent lymph ; the parietal layer was very vascular. The left lung was pale and emphysematous anteriorly, but dark and congested posteriorly, on its surface. On section of the lower lobe and the lower part of the upper lobe, there were evidences of inflammation, and portions, placed in water, sank. The divided terminations of the small bronchi, on pressure, poured forth purulent fluid, and were surrounded by a small portion of lung, of a lighter colour than the rest, giving the appearance, at first sight, of purulent deposits. The upper part of the left lung was crepitant, and contained much frothy fluid. In the right pleural cavity were similar soft, yellowish deposits of lymph, and one or two adhesions. The lung, anteriorly, was pale and emphysematous on its surface, and on section was found entirely occupied by frothy serum ; it was crepitant throughout, except at one part, at the margin of the upper lobe, which was somewhat consolidated, and presented, to the extent of about a shilling, a portion containing much purulent matter on pressure. At the upper part were some divided bronchial tubes, containing purulent fluid, as in the left lung. The heart was healthy. The left cavities contained some coagulated blood, and the right cavities contained a large mass of fibrinous clot, filling up the auriculo-ventricular opening. There were one or two adhesions between portions of the small intestines, and the great omentum was adherent to the surface of the uterus. The ileum was much congested on its peritoneal surface. There was no fluid in the abdominal cavity. The broad ligament of the uterus, and the peritoneum in the pelvic cavity, were much congested, and the ovarian veins on both sides were enlarged and tortuous, the one on the right side being surrounded by much purulent matter in the sub-peritoneal tissue, at its lower part, and being filled with thick coagula. The ovary on this side and the Fallopian tube were intimately matted together, and there was purulent matter in the cellular tissue around the ovary, but the ovary itself was healthy. The Fallopian tube, on section, contained much purulent fluid. On the left side, the uterine appendages were not otherwise affected than by congestion. The uterus itself was larger than natural, and its walls, which were thickened, contained purulent fluid ; this was in the neighbourhood of the entrance of the right Fallopian tube. The cavity of the uterus was dilated, and the lining membrane intensely congested, and covered by a thin bloody fluid. At the upper part of its anterior wall the lining

membrane was very shreddy and vascular. The os uteri was much congested, and deprived of its epithelium. The intestines presented patches of vascularity in the ileum, and in the cæcum were several ulcerations of various sizes, with great vascularity. The other portions were healthy. The kidneys were rather large, and very vascular on their surface; the fibrous capsule easily peeled off. On section, they were greatly congested, and in each kidney one of the pyramids was occupied, at its apex, by a deposit of firm yellowish substance, which was striated at its commencement, as if it were deposited between the various tubes of its structure. The spleen was very soft and friable. The vena cava inferior, as well as the right common iliac vein, was found to contain much coagulated blood, but was not otherwise changed.]

Another consequence of inflammation of the uterus after confinement is the formation of abscess in the neighbourhood—*primary abscess*—produced by the extension of the inflammation along the broad ligaments into the iliac fossa, or by means of the round ligament into the inguinal canal.

Sometimes the inflammation is acute, and matter is rapidly formed. Some of you may remember, for example, the case of a young woman who was in the hospital nearly two years ago; she lost her child thirteen days after her confinement, and followed its funeral on the sixteenth day, the natural consequence of which was inflammation of the uterus and adjacent cellular tissue. She came in four weeks afterwards, very ill with fever, sickness, pain and tenderness and swelling in the left inguinal region, which I was shortly after able to relieve by evacuating an abscess, which pointed through the inguinal canal, spreading along the round ligament into this part, just as you may see an abscess of the same part, or of the testis, from irritation in the prostate gland; the vas deferens being the conducting medium in the male, as the round ligament is in the female.

2. You have now, however, under your notice a remarkable example of chronic inflammation of this part, no less than four years having elapsed since the patient's confinement, but suppuration having only recently taken place; it is the case of Jane Burt, now 28 years of age, who was admitted into Burton ward on the 12th of this month. She has been in the hospital twice before for the same complaint, and we had therefore better begin at the beginning. She was admitted, in the first instance, July 28th, 1847, with hardness and swelling, filling the left iliac fossa, and extending nearly to the umbilicus and pubes, and also to the upper part of the thigh, with pain and tenderness of these parts, the pain reaching as low as the knee, no doubt from the nerves being embedded in the thickened tissues; her pulse was 80, and her tongue clean; but she had occasional cold chills, and perspired greatly, and had been getting thinner and weaker. She had been confined five months before, and said that inflammation and pain came on in the right

iliac region three days afterwards, but was relieved by leeches and other remedies. The left side inflamed shortly afterwards, with great pain and tenderness; and although leeches subdued the disease to a certain degree, the present swelling remained. She required light tonics, support and fomentations, pain and tenderness of the abdomen, with shivering, being sometimes observed. In the following month and beginning of September, blisters were applied, with the effect of lessening the pain and hardness. In October, it is noted that throbbing and shooting pain again required fomentation, which gave more relief than the blisters, and she left the hospital in November, using an opiate liniment. On March 29th, 1848, she was readmitted, the tumour having been lately enlarging, and walking increased it still more; the swelling is stated to have been more towards the lower part of the iliac fossa than before, and to extend more inwards towards the umbilicus; it was hard and inelastic, and the inner edge was somewhat moveable. With rest and blisters the swelling subsided a little; but the difference between her present and former state was this, that the thickened parts obviously adhered to the sigmoid flexure of the colon, so as to interfere with the passage of its contents downwards, and require a system of purgatives. She left at the end of June to go into the country, with some diminution of the swelling, but still complaining of pain from standing and walking, and she was admitted, as we have seen, a third time a few days ago. It appears from her statement, that having ever since suffered from the swelling more or less at different times, she had seven weeks ago become very ill, with violent pain in the lower part of the abdomen, and sickness. The swelling at the same time began to increase, and to give her more pain. She was very thin and weak; her tongue was red and dry from the fever she had suffered from; her pulse was small and irregular, and very quick; her appetite bad, and she slept very little. Her bowels, which were always costive since her former residence in the hospital, had been particularly confined, it appeared, just before the attack, which was therefore owing, in all probability, to obstruction in the colon, first observed three years before as the consequence of adhesions. There was, on her admission, a round prominent abscess, the size of a small apple, below the umbilicus, the skin being very soft and thin, and of a purple colour; and there was extensive deep-seated hardness of the lower part of the left side of the abdomen and iliac region.

Saline mixtures, and a morphia night draught were ordered, and she had arrowroot, beef-tea, and some porter, with meat, if she could take it. On the 15th, I opened the swelling, and found that it was chiefly filled with air, a few drops only of pus escaping at the time, though it is now copiously discharging from its deeper part. She has already much improved, some bark has been added to her saline, and a little wine has been given her.

Here, then, the inflammation, produced four years ago by parturition, has at last ended in suppuration, and when I opened the abscess, and found the cavity filled with air, I concluded that the colon, which had so long been adherent to the inflamed part, had been opened by ulceration, and that there was in fact a faecal abscess communicating with the bowel. No air or faecal matter has been observed, however, in the ten days the opening has existed, and although it is not unlikely that a communication may hereafter form, or may even now exist at a considerable depth, and of small extent, yet on the other hand it may be that the gas generated in the abscess has arisen solely from its proximity to the colon. You may, perhaps, remember a woman, in Hudson ward, who had an abscess in the abdominal parietes, of large size, near the umbilicus, in which, when I opened it, a great quantity of very foetid gas was found, hardly leaving a doubt of its communicating with the transverse colon; but it did not prove to be so, and soon healed up again. Such abscesses not very unfrequently form near the rectum, and are excessively foetid, poisoning a whole ward perhaps when opened, and yet heal up again in a few days.

[This patient was nearly well when she left the hospital, three or four weeks afterwards.]

3. There is another case now in the hospital, which you have had under your notice for a considerable time, in which an unequivocally faecal abscess has formed, in consequence, as it would appear, of an injury, and which is very interesting from the double perforation which appears to have taken place, and the probability of the patient getting well of her complaint. I allude to the case of Jessica Newman, 26 years of age, who was admitted as long ago as the 26th of June last. It appeared from her account, that she first perceived a swelling on the right side above Poupart's ligament, five months before, which formed an abscess, and burst two months after she observed it; that the discharge was thin, and of a brown colour, and resembled faecal matter; and she attributed the swelling to a fall from a chair. On her admission, there were two large openings in the lower part of the abdomen, separated from each other by a bridge of skin; the probe did not go deep, but passed for a considerable distance in every direction under the skin, and the external oblique muscle was exposed below the integuments, as the bottom of the abscess. The extent to which the skin was undermined towards the ridge of the ilium, made me think it perhaps a lumbar abscess making its way round, as it sometimes does, but she had not felt any pain in the spine, and therefore I directed the nurse to watch whether anything like faecal fluid could be observed, and placed her on the use of bark and nitro-muriatic acid, with meat and porter, as her health seemed much affected by her illness. She at first improved a good deal, and the abscess seemed likely to heal, and it was not till July 19th that anything unusual was observed,

when a little light yellow, thick, mucus-like fluid was seen mixed with the ordinary pus, which was however only seen on this day.

August 5th.—The abscess being stationary, and a good deal of loose skin with thin edges encircling the openings, I divided the bridge before mentioned, and opened the skin more freely where it was most separated from the subjacent parts. This was followed by more pain and fever than usual from such an operation, and on the 8th, some more of the same light yellow discharge was evident, and a small perforation was now seen exposed in the part nearest to the umbilicus, into which the probe could be passed for the distance of nearly two inches, certainly below the muscles, and most probably along the bowel, the discharge from which showed that it was a portion of small intestine, and this continued till the 18th, especially before the action of the bowels, after which only common pus could be seen. During this time, fever, perspiration, and weakness were complained of, and were relieved, first by ammoniated saline, and light diet, and afterwards by quinine and porter.

The yellow mucus was observed again for a day or two on September 3rd, but without any illness, and again on October 4th, and the wound seemed during these two months to be slowly but gradually cicatrizing over the surface of the muscle and tendon. On October 28th, however, headache and sickness being complained of, some solid faecal matter was observed to have come away with flatus, and was seen also on the 29th, and I found another small opening through the abdominal muscles lower down in the wound, and more to the right than on the former occasion, and the probe passed for several inches apparently along the bowel. It appeared, then, that the caecum must have been the source of this fresh escape, since solid faeces do not exist in the small intestines, while the former opening, situated more to the centre of the abdomen, communicated with the small intestine, and gave exit to the peculiar yellow matter which is seen to come away from an artificial anus of that part of the canal. The solid faeces have not been observed since this time, but the upper orifice has several times, after apparently healing over, been again opened by ulceration.

There is one more circumstance in the history of this case which should have attracted your attention. Sickness and headache preceded this new escape of the contents of the intestines, but were not relieved by it; the same obstruction, which probably gave rise to the ulceration, continued; fulness and tenderness were felt between the openings and the umbilicus, and then general tenderness of the abdomen, frequent vomiting, and an anxious expression of countenance, pointed out some degree of peritonitis. Some small doses of calomel and opium three times on November 4th, and twice on two or three following days, relieved these symptoms, and on the 11th she was allowed to sit up, air escaping from the openings when she

moved, and when the bowels acted, but not fæces. The same swelling, and slight peritonitis, again took place in December, and were relieved in the same way; but I found it necessary to confine her to bed, as walking about obviously increased these symptoms. Since that time she has progressively improved; no air or faecal matter of any kind has been noticed for the last seven or eight weeks, the wound has got much smaller, and there is at present every probability of her eventual recovery, unless the contraction following the cicatrization of the wound, leads to narrowing of the intestinal canal, and consequent obstruction of its contents in their course. [The wound very nearly, but not entirely healed over, before she left the hospital, no air having been observed for a long time.]

In other cases, however, an artificial anus following an injury is an acute and dangerous disease; for example, a young woman, a nurse-maid, was admitted into the hospital about three months after she had been kicked on the right side of her abdomen by a child, whom she was carrying. The blow was followed by an abscess, which had probably ulcerated in both directions, communicating with the cæcum, and discharging through the skin; this communication produced constant diarrhœa, of an irritating kind, which excoriated the skin around the opening; and chronic inflammation of the mucous membrane of the ascending colon was fatal to her, by gradually undermining her constitution.

An artificial anus occasionally forms in a similar way without any injury, as the consequence of ulceration of the mucous membrane from chronic disease; the ulcer may penetrate the serous coat, and destroy life suddenly; or local peritonitis may save the patient by adhesions from this danger, and give origin to others, as when you see, and that not unfrequently, elongation of the adhesions, and fatal internal strangulation of a portion of bowel round them. Or, again, ulceration may go on after adhesion to the parietal peritoneum, and such an external abscess as you have seen in Newman may take place, discharging the gaseous or liquid contents of the bowel. More frequently these external openings are the sequel of tubercular disease of the peritoneum, such as serofulous children are liable to, which glues the small intestines in such a manner to one another, and to other adjacent structures, as seriously to interfere with the functions of the canal, and lead to ulceration of its walls. In one young lady, I remember, not less than three distinct perforations had formed in different parts of the surface of the abdomen.

We have seen that in Newman the probe used to pass in a straight direction for several inches within the bowel, which was very sensitive to its touch, so that, although sometimes blocked up, the ingesta, on the whole, have passed readily onwards, and very little medicine has been necessary on account of any obstruction. But suppose there is any sudden turn of the

bowel, or contraction of the cicatrix, after the ulcer and artificial anus have healed : the consequence, as you may imagine, will be fatal. It is, in fact, according to my experience, by far the most frequent species of what is called stricture of the rectum, and you have seen its effects in a woman who recently left the hospital, in whom I had to lay open very extensive sinuses, running in every direction in the nates, labia, and vagina ; and it may take place in any part of the intestines in which ulcers of the mucous membrane have formed.

4. I was asked to see a gentleman, in conjunction with Dr. Bence Jones and Messrs. Bullock and Dodd, who had been long in ill health, including in his symptoms pain in the left side ; six months before I saw him he began to suffer from habitual constipation, but for the preceding month the action of the bowels had been regular. There was an enormous gangrenous abscess of the left side, crepitating with air, from the trochanter nearly to the short ribs, with a small slough at one part, emitting a very offensive odour through it. I laid it open extensively, with a little temporary relief, but his strength was quite exhausted, and he died two or three days afterwards. This abscess communicated with the descending colon by a sloughy opening of about three inches in length ; the bowel below this was flaccid and empty, but above it was enormously distended, so that the diameter of the colon was nearly four inches, and the transverse colon had fallen down, as it were, from its weight of fæces, to the pubes, so that the small intestines were all seen between the stomach and colon, through the thin and elongated omentum. There was no disease of the mucous membrane, except at the opening, nor any inflammation of the peritoneum ; and although the bowel was too much destroyed to make it certain that there had not been a thickened stricture at some former period, yet the appearance of the part of the circumference of the bowel which remained, looked much more as if there had been simple ulceration, cicatrized and contracted probably at the time the constipation began, with a restoration of a passage of the fæces downwards, in consequence of renewed ulceration a month before his death, but which at the same time allowed some fæces to get into the cellular tissue, and produce the gangrenous abscess which I found when called in to see him.

5. In this part of the intestinal canal, however, real stricture is very often found, and may lead to the same fæcal abscesses as simple ulceration of the mucous surface. The most extraordinary instance of this kind which I have seen was in a lady, in whom there had been for a considerable time some discharge of fæcal matter from the bladder, mixed with the water. I examined the body with Mr. Keate and some other gentlemen, not having seen the case during life. A narrow stricture of the colon had ulcerated, so as to let the contents of the bowel above it escape into a circumscribed cavity of large size, formed by adhesions in the lower part of the abdomen, having the

bladder and uterus below, and the abdominal muscles and peritoneum in front. Ulceration had taken place from this cavity, so that its faecal contents passed in part into the bladder, and an opening had also formed in the lower part of the sigmoid flexure below the stricture; so that faeces had gone in this circuitous course through the cavity thus formed, into the rectum, without going through the stricture. Besides this, the abdominal parietes had been perforated in two places, so that in one place a large faecal abscess existed below the external oblique muscle, and through the other aperture an enormous foul abscess, nearly gangrenous from the presence of faeces, distended the skin from the inguinal region to the axilla.

6. More often, as you might expect, mischief of this kind takes place in the caecum on the right side of the body, the form of this part allowing of the lodgment of faeces, particularly if there is a plum-stone, or other solid body, to form the nucleus of a mass, which may attain a considerable size. You will not unfrequently see a tumour thus formed in women, particularly after pregnancy, and lasting many years, varying in size according to the freedom with which the bowels act naturally or by purgatives, and sometimes causing pain and tenderness when larger than usual, even when it stops short of ulceration. A collection of faeces thus formed in the caecum and lower part of the colon appears like a solid tumour, which is sometimes partly moveable, though fixed at its base, and may appear like an ovarian, or other tumour; and, on the other hand, other bodies may occupy nearly the same situation. I was asked, some years ago, to see a lady, with Sir Benjamin Brodie, who had long had a solid body in this situation, which gave her at that time the pain and tenderness which an obstructed colon will occasion; but it proved that a large stone, formed in the right kidney, had drawn that body down, as it were, so as to be perceptible through the abdomen, and to interfere in some way with the bowel. The stone, I believe, is in the museum at present.

7. If a lodgment of faeces causes irritation in the caecum and colon, it produces ulceration, abscess, and artificial anus, or faecal abscess and gangrene. A singular and somewhat obscure case was under my care, about three years ago, in the hospital; and when the patient died, some time after she left us, I had an opportunity, with Mr. Sharp, of examining the body. This woman had a solid elastic swelling in the right iliac fossa, and on the outside also of the ilium, so large that it gave one the idea of its being a carcinomatous growth of that bone, likely soon to be fatal, from the emaciation and suffering it had caused; this opinion seemed to be confirmed by the appearance of a round, solid body, the size of an orange, not far from, though not apparently attached to, the liver. After a time, swelling took place in the loins, and an abscess formed, which I opened at the back of the ilium, so that I began to think I must be mistaken, and that there

was perhaps a lumbar and psoas abscess, with caries of the spine. The disease, however, proved, after her death, to have been an abscess communicating with the ascending colon and cæcum by an opening of several inches in length, and an immense collection, of several pounds weight, of a paste-like consistence and dark colour, existed in the loins and iliac fossa, formed obviously of fæces, left in this situation, while the more fluid part had escaped, during many months. The round body felt in the abdomen was the upper end of the right kidney, which had been tilted forwards, in a curved form, by that part of the solid fæcal mass which filled the hollow of the lower ribs.

[*Lancet*, July 11, 1851.]

CLINICAL REMARKS

ON

DISLOCATION OF THE FEMUR.

1. Reduction of recent Dislocation.—2. Dissection of two recent Dislocations.

THE next case on which I will make a few remarks is that of William Duig, 30 years of age, admitted on January 31st, with dislocation of the femur. It appears that he was lowering a scaffold-pole from one floor of a building to another, and the weight proving too much for him to bear, he missed his footing, and the pole fell on his hip, displacing the bone. Probably he was stooping down at the time, so that the head of the bone pressed against the outer part of the acetabulum. The signs of dislocation into the sciatie notch were evident, in the bent position of the hip, the inversion and slight shortening of the limb, the hollow in the front of the joint, and the alteration of relation of the trochanter to the spine of the ilium, and the prominence, not very distinct, however, made by the head of the bone internal to that of the trochanter; and on trying to move the bone no crepitus was felt, as if there were any fracture.

You saw the reduction effected in the theatre, under the use of chloroform, the patient being placed in the position usually recommended for this form of dislocation, namely, on the sound side, with the thigh a good deal bent upon the pelvis, while extension was made from the knee, and counter extension from the perineum. Extension was gradually increased; and you must remember, that under chloroform greater caution is necessary than when a patient can complain of pain. Shortly the head of the bone came down to its proper level, and I tried several times, by lifting the bone close to the joint, while the knee was held down, and, by rotating the limb, to raise the head from behind the prominent part of the acetabulum, which resisted the return into the socket: but it would not rise sufficiently from

this hollow, nor yet by bending the joint a little more, and therefore, at the end of fifteen minutes, I endeavoured to make the head rise over this obstacle by suddenly intermitting the extension, and quickly drawing the knee backwards, as a lever, so as to make the head rise forwards, while force was directed against the neck of the bone as a fulcrum ; but the cord in the pulleys, as you saw, would not run quickly, and therefore the head directly went backwards towards the sciatic notch. Accordingly, extension was immediately resumed, and the head drawn down again, but still it would not enter the socket till after I had twisted the bed, and with it the patient's body, while the extension was continued, so that the femur was placed nearly in a straight line with the body, instead of being bent on the pelvis, which change seemed to enable the adductors to draw the head over the edge of the acetabulum, which they could not do in the bent position of the joint ; it thus returned with a jerk into the socket. I do not mean by this to recommend you always to do this, because I think the bent position is generally the best ; but only to show that, in reducing dislocations, some peculiarities, which you cannot always understand, will be overcome by varying the direction of the force you are using.

You saw how greatly the patient complained of the pain occasioned by examining the limb to ascertain the nature of the injury, and this is perhaps explained by the fact noticed by Mr. Quain, of the sciatic nerve being much stretched across the neck of the bone, and by another case of Mr. Wormald's, in which it actually lay subject to pressure between the head of the femur and the innominatum. There is no case, perhaps, in which the advantages of chloroform are so apparent, as in the reduction of dislocations, not only from the entire removal of the very great pain of long-continued extension, but in the complete relaxation of muscles which it produces, leaving the form of the bones, or the stretched ligaments, in some cases, as the chief obstacles to reduction, instead of the usual muscular action.

I think you cannot but have been struck with the entire freedom from pain and inflammation which this man has enjoyed in the week which has elapsed, notwithstanding the violence necessary to dislocate the thigh from so strong a joint ; in fact, he has only been kept quiet as a precautionary measure, and to strengthen the renewed attachments of the ligaments and other injured parts. [The patient insisted on going out a day or two afterwards.]

In fact, however, the violence is not so great as you might imagine, and the parts torn are sometimes very few, and the injury trifling. The dislocation into the sciatic notch, as it is usually called, is rare, and the opportunities of dissection in recent cases fortunately still more rare. It does not appear that Sir Astley Cooper ever had this opportunity, nor Mr. Bransby Cooper, who edited his uncle's great work on Dislocations ; and it is curious that Mr. Liston says he never saw this form of dislocation at all, except when he

himself occasioned it in endeavouring to reduce a dislocation in the thyroid foramen. What little has been observed on the subject is contained in a paper by Mr. Quain, in the 31st vol. of the *Medico-Chirurgical Transactions*; and in the plate on the table you will see the exact appearance of a recent dislocation dissected by him. In this case the pyriformis was slightly stretched, and the gemelli and obturator internus were in a state of extreme tension; and the only muscles which sustained real injury were the obturator externus and quadratus femoris, which were completely torn across.

I can corroborate from a case of my own the observations made by Mr. Quain, as to the position of the head of the bone, which is almost universally described, from Sir A. Cooper, as being on the edge of the bone in the greater sciatic notch; while in reality, the bone, in what is termed dislocation in the sciatic notch, really lies on the spine, or in the space between the tuberosity and the spine of the ischium; and the observation of Boyer and other French surgeons may be correct, that when it actually lodges on the edge of the great sciatic foramen, it has been first dislocated on the dorsum of the ilium, and has afterwards passed more backwards.

I have brought for you the notes of my case, which is that of a man, 32 years of age, who was admitted under my care as long ago as April 28th, 1837. On the preceding day, while in a stooping posture, with his legs across some wood, a large piece of timber fell upon his back, which dislocated his right thigh-bone, and produced much contusion of the groin. The dislocation, which was in the sciatic notch, was readily reduced, perhaps from his depressed condition, by Mr. Neville, of Esher. But in the night the perineum and scrotum began to swell, and rapidly increased by the morning, with much discoloration of the skin; and, on introducing a catheter at three different times, no water was found in the bladder. He was therefore sent to the hospital.

There was in fact effusion of urine in the perineum and thighs and scrotum, and in the cellular membrane at the lower part of the abdomen. After the necessary incisions had been made, he went on very well for a time; but, on the third day, pain and fever came on; and he died with stupor on the 2nd of May, five days after the accident.

The symphysis pubis was separated, and a small piece of the right os pubis broken off; the left transverse and descending ramus of the pubes were broken, and the right synchondrosis ilii separated without fracture. There was a large cavity, containing quantities of coagula and urine, with commencing suppuration, between the pubes and bladder, raising the peritoneum nearly to the umbilicus, and pushing the bladder back, in the front of which was an aperture the size of the end of the little finger, corresponding apparently with the symphysis pubis in situation, by pressure against which, in fact, the bladder is often ruptured. The blood from this cavity

communicated with extensive effusion behind the peritoneum, on both sides of the spine, reaching upwards to the diaphragm, and passing up into the coats of the bowel, in the rectum, colon, and mesentery, no suppuration having taken place in these parts. The peritoneum next to the urinary cavity was slightly adherent to the omentum, but there was no general inflammation of this membrane. I read this to you, though irrelevant to the subject of dislocation, because it is interesting from the enormous extent of the effusion.

The *psoas magnus*, *iliacus*, *tensor*, and *sartorius* were removed, and found perfectly uninjured, and the front of the capsule quite safe ; and, on opening it, there was no trace of blood. The *pectineus* and three adductors were not at all torn ; but there was some blood in them, and they were partly sloughy from the infiltration of urine. The *pyriformis*, *gemellus superior*, and *obturator internus* were quite uninjured ; the lower third of the *gemellus inferior* and the upper two thirds of the *quadratus* were torn across, and a hole was thus formed, through which the head of the femur readily passed. The *obturator externus* was very slightly torn. The capsule was not torn till where it is attached to the neck of the femur, where it is naturally very thin ; here a rent existed, running about an inch and a half round the bone, through which the head easily passed when not held in the socket by the air, and then passed readily with a little rotation inwards on the space between the tuberosity and spine of the ischium, not being able to reach so high up as the sciatic notch. The round ligament was completely torn across at its attachment to the acetabulum.

Such, then, is the nature of the so-called dislocation into the sciatic notch in my own case, and you will see in this paper that it corresponds with slight modifications with Mr. Quain's and one or two others on record.

There was, a few years ago, in the hospital, a very singular and unusual form of dislocation, which was minutely dissected very shortly after the injury, which I will read to you from the post-mortem book :—

“James Millward, æt. 70, admitted May 3rd, 1841. The thigh-bone had been dislocated directly upwards, the neck of the bone, lying upon the upper part of the margin of the cotyloid cavity ; the great trochanter was directed outwards and backwards. The head of the bone was bounded anteriorly by the two lesser glutei muscles, and partially by the *tensor vaginæ femoris*, which was spread out. To its inner side were the *sartorius* and *rectus femoris*, and to its outer side the posterior fibres of the lesser glutei muscles. The capsular ligament presented an extensive laceration towards its upper part. The *ligamentum teres* was ruptured a little before its attachment to the cotyloid fossa. There were five muscles which were partially ruptured. The *gluteus medius* and *minimus* were nearly torn through at about two inches from their attachment to the *trochanter major*. A few fibres of the

gemellus superior were ruptured ; the two lower thirds of the fibres of the gemellus inferior and the upper fibres of the quadratus femoris were torn through. The other muscles were not injured.

"The thigh-bone of the opposite limb was fractured at the lower third, and several ribs of the left side of the chest were also fractured.

"The patient died a short time after his admission, without reduction of the dislocation."

You see, then, that the bone was not dislocated into any one of the recognized situations ; and there are very few descriptions of injury which appear to have borne the least resemblance to it.

[*Medical Times*, April 1854.

UNREDUCED DISLOCATION OF FEMUR.

June 15th, 1847.

THERE is an instance in the house (if the man's account be correct) of deformity resulting from the inattention of his surgeon, though you must not place implicit confidence in all that patients say on such subjects.

John Doughty was admitted on June 2nd, into Winchester Ward, with, our notes say, "Fulness of the left buttock, and displacement of the head of the femur into the sciatic notch. He cannot straighten the limb ; the pelvis moves with the femur ; the limb is half an inch shorter than the other : slight pain on pressure. Had a fall ten months ago, and fell on the left side. After the fall he felt and heard the bone move when the joint was tried. He cannot straighten the thigh, so as to stand upright, and the knee is advanced before the other ; the head of the bone can be felt in the notch, and cannot be moved much in any direction, and the attempt gives pain. He can walk pretty firmly, though lamely, and with much stooping, without a stick."

He tells us that when first seen the hip was not subjected to any examination whatever, but he was treated by his surgeon without this absolutely necessary precaution, so that it is no wonder that the true nature of the accident escaped observation. He is more fortunate than some patients are who suffer from unreduced dislocation of the hip, in being still able to walk, and there is hope that he may in time regain more use of his limb when a new joint has formed, and the flexors have relaxed as much as they can, and the head of the bone has perhaps become smaller.

If the history he gives be true, it is probable that a simple dislocation of the head of the femur existed, which might at the time have been reduced with ease, but now, after an interval of ten months, while he is regaining the power of using his leg, no attempt ought to be made to replace the bone. Any effort made now would break through such adhesions as have already formed ; the old socket is probably partly filled up and obliterated, and unfit to receive the head of the femur, which is itself also, no doubt much altered

in shape; inflammation would be set up, and the patient would be left in a worse condition, and with a limb more useless than it will be if left to nature. There is no exact time which can be fixed upon as the latest period at which it would be proper to attempt to reduce a dislocated limb. After three or four, or five months, you would probably be justified, in the great majority of cases, in declining to interfere. In thin persons you might, perhaps find, upon careful examination, that there were no symptoms indicative of a new joint having been formed, or of the acetabulum being altered, and in such persons you might successfully endeavour to replace the limb even six months after the accident.

It is not impossible that in our patient something more may exist than a mere dislocation; it may happen that a portion of the upper and back part of the acetabulum was broken at the time of the accident, and the bone thus allowed to slip backwards from its socket. The difference in the symptoms, if such an occurrence had taken place, would be, that the bone would be capable of being brought back into its proper place with greater ease than in a dislocation, and that upon the extension being removed it would again slip from the acetabulum; and crepitus can generally be felt upon moving the limb. There would be much more mobility also. You have an instance of this accident now under your notice in a patient under Mr. Tatum's care, and in him you may observe that the leg can be brought to its proper length with ease, and the thigh can be flexed, so that the knee will nearly touch the abdomen—a very opposite state of things to the rigid immobility of dislocation such as you see in Doughty. If, as I before observed, the man's account be correct, and the surgeon under whose care he was at the time of the accident knew of his present condition, his satisfaction with himself would not be very great at seeing a man crippled for life who might, if properly treated, have been possessed of a perfectly sound and useful limb.

[*Medical Gazette*, vol. v., new series, p. 403.]

CLINICAL REMARKS

ON

DISLOCATIONS WITH FRACTURE.

June 16th, 1846.

1. Lateral Dislocation of Elbow—Fracture of Humerus.—2. Dislocation of Humerus and of Carpus—Palsy of Hand.—3. Dislocation of Innominatum—Fracture of Sternum, Humerus, Tibia, and Fibula—Wound of Knee and Perineum—Secondary Abscesses.

I. THE next case to which I will draw your attention is one of fracture and displacement of the elbow-joint of not a very common kind, in which you have seen the difficulty that frequently arises in the diagnosis of injuries of this joint. John Street, 32 years of age, was admitted on the 5th of this

month in a state of drunkenness, with fracture and some displacement of the internal condyle of the humerus in the left elbow-joint, and displacement of the olecranon of the ulna inwards; but the ecchymosis around the joint was too great to admit of the determination of any other part of the joint being fractured. It was caused by his falling from a hay-rick on his elbow. An angular splint was placed on his arm on the inner side.

When I saw him the next day the pain was considerable, and the swelling extended from the fingers to the shoulder, with considerable tension of the arm: the quantity of blood was, indeed, so great that you may still see it after it has made its way from the elbow to the trunk of the body, where the whole of the back from the hip to the shoulder is discoloured; and the pressure of this effused blood of course impeded the circulation, so as to produce much œdema of the hand and forearm. I did not, therefore, even examine the elbow, which at first only gives unnecessary pain; the motion and position of the several parts are made very obscure, and even if you could ascertain the nature of the displacement, it is no use trying to reduce the dislocation, if there be one, till the tension is lessened so as to allow of the bones being moved. A dozen leeches were applied, with cold lotion, and were repeated the next day; and on the 8th I examined the joint, as the swelling was somewhat lessened. It was quite clear that the internal condyle was displaced, and could be moved with crepitus, and that there was a lateral displacement of the forearm, but I could not quite satisfy myself whether there was not some other fracture of the end of the humerus, or of the head of the radius, and some fracture may exist in these cases without crepitus being at first perceived, while the blood and swelling separate the portions of bone from one another.

The prominent outer condyle seemed from measurement as if it might have a small portion of the head of the radius left attached to it, and I almost thought I could bend the end of the humerus on the shaft, close above the condyles, such a transverse fracture being not unfrequent along with the oblique separation of one or other condyle. I could not examine it much, however, on account of the swelling, and again applied some leeches, and on the 10th I made out satisfactorily what was the state of things. It appeared that besides the fracture of the inner condyle, which was carried inwards and a little upwards, and was very moveable, there was a complete lateral dislocation of both bones of the forearm inwards, so that the external condyle was very prominent, with a hollow below it, where the head of the radius should have been, which was carried deeply among the muscles, so that its head lay in the hollow of the joint, nearly where the ulna should lie, or a little behind this hollow, while the ulna was carried inwards, where it projected unnaturally, and the distance between the outer condyle and the olecranon was nearly doubled. Much pain was felt if entire flexion was

attempted, but there was not much prominence of the condyles in front, nor of the ulna backwards, as in the much more common dislocation of both bones backwards, or backwards and at the same time partly to one side. The motion also was different, as here the arm could nearly be bent or straightened, though with pain, which cannot be done when the bones lie behind the humerus. Mr. Keate agreed with me that this was the nature of the accident, and we made a slight attempt to reduce the dislocation, and once I thought I felt the bones slip into their place, and immediately start out again. I once more applied a dozen leeches, and the swelling was sufficiently reduced on the 12th for me to succeed in the reduction by means of the pullies, which I recommend you generally to employ, when a dislocation has existed some time, as effecting your object with much less pain and injury to the patient, by the quiet and continued extension which you can employ without any jerking and irregular movements which take place when you have only the muscular exertions, of yourself and your assistants. You saw me make extension from the wrist, and counter-extension from the lower end of the humerus, the elbow being at first nearly at right angles, while extension was made in another direction from the upper end of the forearm, at a right angle with the line of the two other forces, in order to draw the ulna and radius away from the humerus, while they were being pulled downwards from the wrist and upper arm. I also tried an alteration of the line of extension for a short time, letting the humerus and forearm lie in the same direction, while the cross force was employed, and I endeavoured to assist the return by moving the ends of the bones upwards and downwards so as respectively to separate the ulna or radius from its position on the back of the humerus. After a few minutes you saw that the bones returned to their places, with an audible sound, as the notes say. An inner angular splint was then applied in front, and a short splint opposite to its two branches on the back of the humerus and forearm. Some swelling returned after the reduction, which has been much reduced by leeches since. It is probable that there will be some stiffness of the joint for a time, but after the bone has united I hope the motion of the joint will be tolerably good.

You are commonly directed after fractures and dislocations to adopt regular passive motion in a short time, but it is generally better not to do so, and to be contented with merely satisfying yourself that there is no ankylosis, and not to use motion till all inflammation is gone. You are not unlikely to favour the organization of the effused lymph, if you move the joint while pain still continues; while perfect rest, on the other hand, facilitates its absorption.

II. The next case offered two dislocations to your notice, and suggests a few observations. John Sims, æt. 45, was admitted on the 7th of May, with

dislocation of the left humerus, under the pectoral muscle ; the arm is kept flexed, projects out from the side, is supported at the wrist, which he at first supposed to be broken ; the arm seems longer than the other ; the acromion is prominent, and there is loss of prominence of the deltoid muscle ; on placing the finger on the pectoral muscle, or in the axilla, and rotating the elbow, the head of the bone is distinctly felt. The accident was caused by his falling from some steps, on his shoulder, four days ago ; he went on the 4th to a surgeon, who examined the forearm, and said it was bruised, and when he again examined it, the next day, the dislocation was undetected.

The notes which I have read to you describe exactly a dislocation of the humerus forwards ; and when I directed the man's clothes to be taken off, the accident was so clear, that I saw some of you put your fingers to the shoulder before I said a word with regard to its nature ; but it suggests to you the important lesson of entirely exposing parts likely to have been injured : the surgeon to whom he was sent was one who would have known in an instant, if he had done this ; but as it was imperfectly examined, his master was dissatisfied, and sent him here.

I had him immediately taken into the room, and the notes say it was reduced by making extension with the pullies, and by suddenly depressing the arm and drawing it forwards, so as to force the head back into its place ; it returned without any snap, and the pain he previously had in the forearm was much relieved ; the arm was then confined to the side with a bandage. There was no difficulty in doing this ; only remember to throw the elbow forwards while you are holding the neck of the bone with one hand firmly as a fulcrum by which to move the short end of the lever (that is the head) backwards ; for want of attention to this, and simply depressing the arm as for the dislocation in the axilla, I have known a surgeon several times fail, the head going upwards again in front of the glenoid cavity.

On the 11th, the shoulder was free from pain, and with good motion ; the bandages were removed, and he has continued to have the full use of the shoulder. You will often be surprised in dislocations of the ball and socket joints—the shoulder and hip—how little inflammation there is, compared with the elbow-joint, which we have previously considered, and in which repeated applications of leeches were required, while rest alone for three or four days has here been sufficient. But on setting the arm free a new and important circumstance became evident ; on examining the hand, which he said he could not use, it appeared that there was free motion everywhere above the wrist, including the rotatory movement of the radius, if the hand was supported, but not otherwise ; and he had no power of extension, and very little of flexion of the wrist or fingers and thumb, though the sensation of the hand was perfect. There was no pain or swelling, and no tenderness,

but the *os magnum* and *unciforme* slipped out of their socket into the palm on the least force being used, without any crepitus, and without any pain; the alteration of the line of the hand with the arm being more than half an inch when the displacement was produced: the posterior ligaments were entire, so that no projection of the hand backwards could be produced.

This dislocation of the first and second row of the carpus from one another is by no means common, though the form of the bones easily explains how it can take place, if a person falls on the hand while it is much bent, particularly forwards into the palm; I suppose, too, that the trapezium and trapezoides remain undetached from the scaphoid bone.

The hand was directed to be placed on a splint, with a pad in the palm, to keep the second row of the carpal bones in their place. But although the joint has become quite firm again, he has not recovered the use of his hand, and I fear it may be some time before he does so. On the 14th it is said he complains of some pain, which extends from the wrist to the elbow, and of slight pain in the shoulder. On the 15th, he can bend and extend the fingers better, and the hand is painful only at night: and on the 18th, he can bend the fingers better. On the 20th, however, there was some more pain, and for both reasons I ordered a blister to the back of the wrist. On the 22nd there was a good deal of swelling and effusion into the joint, to which cold was applied, and on June 8, another blister, and the wrist seems now to do quite well; but although he can bend the fingers a little, his hand drops from palsy of the extensors, and he has scarcely any voluntary power in them.

I cannot exactly explain to you on what this paralysis depends: it is not at all uncommon to see some palsy of the arm after a dislocation of the shoulder, from the inflammation of the nerves in the axilla, excited by the pressure of the head of the bone and the stretching of the nerves by the injury itself, or by the reduction; and I have known this last for many weeks afterwards, and very slowly subside. You would especially expect that the circumflex nerve would be affected, as it passes round the neck of the bone, and that the patient would not be able to raise the arm for a long time by the deltoid muscle. The whole arm is also weakened, from injury to all the nerves in the axilla, but here is perfect motion above the dislocated carpus;—even the supinators are not injured, for he can rotate the hand freely if its weight is supported; but the extensors of the wrist and fingers, and thumb, are nearly powerless, and the motions of the flexors much impaired, and he is positive that it is entirely owing to the accident; and it seemed to precede the time when he had most inflammation in the joint, which has never been severe. The hand drops exactly as it does in a case of palsy from lead, but he tells us he has been never exposed to the influence of it, and the palsy only affects the injured hand, and came on from the injury; and he

has no definite sign of lead in the blue appearance of the margins of the gums. There are, indeed, some dark spots, but you often see them in the lower orders of people, from some neglect of cleanliness.

I have at present treated it by supporting the hand as Dr. Pemberton recommended for lead palsy, and which was necessary also for the dislocation; and I have applied two blisters as I have mentioned, but hitherto there is only very partial amendment, and that chiefly in the flexor muscles. [It appeared subsequently that the spiral nerve was probably injured, from pain and tenderness in its course, and several small blisters were applied to it, with the effect of relieving the tenderness of the nerve near the elbow, and of slowly restoring the muscular power, which has gradually returned, though it is not yet perfect.]

III. Another case to which I will direct your attention is that of a poor girl, Dinah Green, 17 years of age, who has been the victim of a barbarous practical joke; for having been told that her mother was dead, the intelligence, which was false, produced such an effect on her mind that she threw herself out of a window five stories high, alighting on her left side. She was admitted May 11th, with transverse fracture of the left humerus, about two inches above the elbow-joint; transverse fracture of the middle of the left tibia and fibula; fracture of the sternum at about the lower part of its middle third; a superficial excoriation of the inside of the left knee, and of the perineum; with great pain and much mobility, but no crepitus in the situation of the left sacro-iliae articulation and symphysis of the pubes.

Here there was a complication of injuries, from which it is no wonder that she was insensible for a few minutes after the accident, and was very low and restless till the following day, requiring some æther and opium. I have little to say in detail of most of the injuries, however. The fractured leg is enclosed in stout bandages at present, and is united tolerably firmly. The fracture of the humerus also is uniting, though more slowly than the leg, and there was at first a good deal of swelling in the elbow-joint and around the fracture. The wounds of the perineum and knee have healed; the latter having been followed by some little inflammation and swelling of the knee-joint.

A fracture of the sternum is commonly easily detected by tenderness and crepitus, as it was here; and it frequently produces no symptoms except the local pain, as you may easily suppose when you look at this bone, which was broken in a patient of mine, and in which you may see that the internal periosteum has not even been torn, the bone being only bent back, as the spine was also, and injured the spinal marrow fatally. In other cases the internal parts are much injured; the heart and great vessels may be ruptured, or there may be suppuration in the mediastinum, or injury of the lung. In

our patient the notes on the 13th say, that she complained of pain in the chest at the situation of the fractured sternum, but there is no cough. On the 16th, also, much pain in the chest, but no cough; and it stated that it was worse during deglutition, the reason for which is not very apparent. This pain gradually went off, and required no treatment.

An injury to the pelvis, however, is generally of more importance than one to the sternum, and it has produced considerable distress to our patient. Fractures and dislocations of the bones of the pelvis being commonly the result of great violence, as in this instance, from a fall from a height of five stories, are necessarily very dangerous, from the injuries to the viscera which they produce, or the great inflammation which follows them; but if these dangers are escaped, they may do very well; for instance—I have often seen fractures of large portions of the innominatum, as in this preparation, do very well.

The nerves of the bladder and rectum generally suffer in these injuries; and such has been the case here. On the 13th it is said, there is incontinence of urine from an overloaded bladder, and when a catheter was introduced two pints of urine were drawn off, of a natural colour and the catheter continued to be required for several days. On the 18th it is said, she passed her water herself to-day, and she has continued to do so since that time. There has also been some paralysis of the sphincter ani, and from the same cause, but it has been less regular, and has been felt later than the weakness of the bladder. On the 19th it is said, there is incontinence of fæces, but she passes her urine voluntarily. On the 21st both were passed naturally, but on June 1st, and once or twice even recently, the sphincter has given way involuntarily.

The chief danger in many cases is from inflammation of the cellular tissue of the pelvis, with suppuration, and subsequent peritonitis. In our patient, on the 14th, late in the evening, the third day after the injury, it is said, she complains of great pain on the left side of the lower part of the abdomen, which she has had slightly for a day or two, and the house-surgeon very properly gave her two grains of calomel and half a grain of opium every three hours, with saline medicine, and applied some leeches, and fermentation. The next day it is said she feels rather easier, but still complains of pain in the iliac region: she seemed to me, however, to have so calm an expression of countenance, and to be so free from the severer symptoms of peritonitis, that I countermanded the mercury, thinking she expressed more than the actual inflammation justified. On the 18th the pain was more severe again, and extended across to the other side of the abdomen, and I felt afraid myself that there was a good deal of cellular inflammation, which might spread to the serous membrane if unchecked, and I gave her one grain of calomel and a quarter of opium every six hours, and the next day gave it twice, and then omitted it, the pain being much less, and not having since returned in the same way, though she has made some complaint occasionally.

I understand, however, from Dr. Thomas Chambers, that her attention has been much directed for some time to the abdomen, and that she herself fancies that she has Dr. Baron's disease of the peritoneum, of which in reality there is not any sign, and perhaps, therefore, there was not any inflammation of importance. She is now, however, going on well, except that she has unfortunately a slough on the back, caused by her being very thin, and unable to move herself, and hardly able to bear being turned at all to either side, on account of the injury of the pelvis; indeed, she cannot lie on the left side even for a short time.

It is probable that dislocations of the pelvis are not so dangerous in themselves as fractures of these bones, unless they have been produced by a greater degree of violence, causing injury to the viscera, or great internal hæmorrhage and inflammation. At all events two dangers attend a fracture which do not arise from dislocations. A man was brought to the hospital from some distance in the country for a fracture of the thigh, which was all the injury he was known to have suffered; on the journey, however, in a cart, he was seen to become very faint, and only lived a short time after he reached the hospital. On examination, it was found that there was a fracture in the usual situation across the transverse ramus of the pubes; and in the movements of the cart probably one of the fractured ends of bone had punctured the femoral vein, and the blood had thence been driven with great force into the cellular tissue of the pelvis and abdomen, behind the peritoneum, reaching as high as the diaphragm, and between the folds of the mesentery to the intestines. The other danger from a fracture is more common, and is not unfrequently fatal, the fractured ramus of the pubes tearing the urethra, and causing extravasation of urine, and suppuration and necrosis of bone, as in the boy from whom this preparation of several fractures was taken.

A dislocation of the symphysis pubis not unfrequently happens, and I have more than once seen rupture of the bladder occasioned by it, and often some blood escapes with the water for a day or two, the two bones being as completely torn asunder as in the section formerly practised in parturition. Dislocation of the sacro-iliac joint requires a great degree of violence, and is very often fatal; and is also often accompanied by fractures of the innominatum; and sometimes both of these joints are dislocated in the same case with or without fracture. In this patient the mobility of the left innominatum was so great, that I could move it upwards and downwards nearly an inch, making the opposite pubes or the sacrum project; and I conclude that the joints are dislocated, as there is no crepitus when the bone is thus moved; but as the fragments get separated when broken, the crepitus is not always felt, and there may be one, therefore, in addition to the dislocation. Sometimes you can cause the crepitus by pressing the two sides of the

pelvis towards each other, so as to bring the fractured portions in contact ; but I did not perceive it in this case.

From the great violence necessary to produce these dislocations or fractures, the accident is of course often fatal ; but they do occasionally allow of recovery, even when severe, as I hope will be the case in our patient. I remember some years ago a man being brought to the hospital, who had been run over by a cart, in whom the right innominatum had been dislocated from the sacrum, leaving this bone projecting considerably. Being placed on his face, a good deal of force was used by several persons while the innominatum was drawn outwards on one side, and the pelvis held steady on the other, and the displaced bone returned to its place suddenly, with an audible sound. There was incontinence of urine and of fæces, from paralysis of the sphincters, with a good deal of blood in the water. The patient had great pain in the abdomen, and inability to use the legs from the pain it occasioned, and from partial loss of power over the muscles, and much anxiety and distress ; but in a short time the urine became clear, and the patient perfectly recovered.

So also with severe fractures without apparent dislocation. A man, for instance, was under my care about the time when some murders in Edinburgh, connected with our profession, led to the introduction of a new word in our language ; he dreamed one night that he was being *burked*, and getting out of bed, fell from the top to the bottom of a house, through a skylight, which in some measure broke his fall, or else he probably would have been killed. He was at first pale and insensible, and then remained for some time exceedingly low and depressed, with great effusion of blood in and around the pelvis, which was broken across one side perpendicularly. Some hours afterwards the catheter drew off about a table-spoonful of urine and blood ; then none whatever was found, so that I feared a rupture of the bladder ; but it was in fact suppression of the secretion, and the next day two or three ounces of foetid urine, loaded with sulphuretted hydrogen, were drawn off. The power of expulsion returned on the third day ; then it ceased for a few days more, after which he made water in proper quantity voluntarily. The legs were paralyzed and nearly insensible for some time, and he only slowly regained the power over them in six or seven weeks, when the bone had united. He had also much inflammation, and was threatened, as in our patient, with peritonitis, but finally got quite well. I am in hopes, therefore, that our patient, having gone on so well hitherto, notwithstanding her complicated injuries, will also recover in time. [This favourable condition described on June 16th did not continue, however. On the 22nd she had a slight rigor ; on the 24th another, which lasted an hour and a half. On the 28th, rigors continuing, she began to complain of cough, and afterwards of pain in the chest and difficulty of deglutition, and she died on the 30th,

having some convulsive twitchings of the face before her death. The post-mortem appearances were as follows :—

Thorax.—The right lung was, towards its posterior part, loaded with red frothy serum ; in other respects this organ was healthy. In the left pleura there was a small quantity of lymph recently effused, and adhering to the pleura, covering the back part of the lower lobe of the lung, which here presented a well-marked specimen of partial consolidation from red hepatization. Several small secondary deposits, the centre of which was softened, also existed in various parts of this organ, the remaining structure being healthy. The heart presented nothing remarkable.

Abdomen.—The viscera contained in this cavity presented nothing remarkable ; but in the left iliac fossa, and in the neighbouring parts, were evident traces of an extensive extravasation of blood. The left os innominatum was extensively fractured, its iliac portion being broken up into several fragments, which were firmly but irregularly united to one another, forming in some places large irregular projections. The pubic portion also presented a fracture running across its transverse branch, and another one at the union of the rami of the ischium and pubes ; these fractures were not united, and a small portion of matter was found between the fragments. The sacrum and ilium were widely separated from one another at the left articulation, and some matter was found between these bones.

Left inferior extremity.—The left leg had been fractured towards its lower part : both bones were, however, firmly and regularly united, but a small portion of the tibia was necrosed, and a quantity of foul matter was found in the neighbourhood, particularly towards the back part. A quantity of foul matter was also found in the left knee-joint, with some small clots of blood, and the cartilages were partly absorbed, but not to any great extent.

Left superior extremity.—The humerus was broken at its lower third, and the fragments of the bone were partially riding over each other, being united by soft tissue, in which a deposition of bone had begun to take place. The extremities of the fractured portions were rounded off.

Right forearm.—A large quantity of foul pus was found in the subcutaneous cellular tissue of this region.]

[*Medical Gazette*, vol. iii., new series, p. 221.

FATAL SUPPURATION IN CASES OF SIMPLE FRACTURE.

June 15th, 1847.

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1. Fractured Ribs—Inflammation of Lungs and Pericardium.—2. Fractured Fibula—Abscess of Tibia.

YOU have just seen, in the room behind us, an instance of the effects produced by neglect and intemperance, in a man who met with an accident,

which, under ordinary circumstances, would have been attended with but very little risk, but in his case has proved fatal.

James Cook, æt. 40, was admitted, on June 10th, into Oxford Ward, with difficulty of breathing, pain on drawing in his breath, pain on pressure about the ninth and tenth ribs, on the right side; no fracture could be discovered; dry cough, attended with pain, but no expectoration.

Pulse 130; tongue dry, loaded; countenance anxious. He fell against a curb stone on Saturday the 5th; the pain commenced on the 6th, and a rib roller was applied on the following day: he had been suffering from diarrhœa before his admission. These symptoms made me suspect that he had fractured some of his ribs; and when he was admitted he was in fact labouring under an attack of acute inflammation of the lungs and pleura. For this, he was bled, and had a dose of calomel, and some haustus sennæ; and when I saw him, for the first time, on the following day, he expressed himself as relieved by the bleeding: the blood drawn was buffed, and slightly cupped; tongue cleaner; pulse 100, soft; cough, but no expectoration; bowels open. Some antimonial wine and tinct. camph. c. in a saline draught, were ordered every six hours; but on the next day, we find that this temporary amendment had soon ceased, and our notes are, "Much effusion in right lung, rapidly increasing—some, also, in left; tongue very dry and brown; pulse very quick; skin hot and dry;" so that with this acute inflammation of low character, existing on both sides of the chest at once, in a person of intemperate habits, in spite of all that was done for him, by Dr. Nairne as well as myself, he died yesterday, June 14th: and you have just seen that there had been acute inflammation of the whole of the right lung going on to hepatization, general inflammation of the pleura of that side, with universal adhesions, and inflammation at the back of the lung of the opposite side, with tubercles in a quiescent state at the upper part; thus leaving him only a small portion anteriorly to breathe with. You saw also that three of the ribs (the fifth, sixth, and seventh) were broken near their cartilages, and that their fractured extremities were surrounded with pus, and the intermuscular cellular texture immediately around was infiltrated with pus also; thus converting a simple fracture into a compound one, if he had lived to have had the abscess opened. The inflammation, too, had passed round from the point where the ribs were fractured, so as to affect the pericardium, as was evident from the infiltration of the cellular membrane around, and the effusion of serum into its cavity; so that it is no wonder that with all this mischief going on at once, the treatment we adopted should have been unsuccessful. The large, soft, and congested liver, was probably owing to his intemperance, and the granular state of the kidneys may no doubt be attributed to the same cause; and these giving him a predisposition to

inflammation, his intemperance and neglect of the injury in the early stage easily proved fatal to him.

It so happens that there is now in the hospital probably another instance of a fracture, originally a simple one, being rendered compound by the neglect of proper precautions.

James Fry was admitted on June 8th into Fitzwilliam Ward, with, our notes tell us, "enlargement and thickening around the head of the fibula, and some thickening of the skin around the head of the tibia. There is an opening leading down to the fibula, discharging purulent matter. No pain in the knee. He fell into a pit six weeks ago, and struck his knee against some iron; the knee swelled, and was painful, and afterwards a swelling formed on the outside of the leg, which was opened three weeks ago. Has been in the habit of drinking." The man walked for about two or three days after the accident, and the irritation produced by it brought on inflammation, terminating in suppuration and the formation of abscess.* If a man have granular kidneys, or even if his health be not so undermined as to have produced that condition, the formation of matter around a simple fracture is a matter of serious import. There was a man admitted under my care two years ago, who met with an accident by which he broke his fibula. He walked about on it for two or three days. This, you know, it is possible to do after such an accident, the tibia serving as a kind of splint; and, indeed, without careful examination, fracture of this bone is sometimes very difficult to detect. When you cannot detect it satisfactorily at the time, in consequence of swelling, if you have any suspicion, be careful and examine the limb again a few days after, because, if left to itself, a broken fibula may heal in a wrong position, and be ever after a source of serious inconvenience. The man of whom I was speaking was admitted nine weeks after his accident with an abscess on the inner side of the leg, and with one threatening in the knee-joint. I opened the abscess in the leg, and there found a portion of the broken fibula, from two to three inches in length, exposed and dead,—the consequence of the abscess; and the man died shortly after of secondary deposits in the lungs and in other parts of the injured limb. He, too, was, like the patients under your notice, of intemperate habits.

[*Medical Gazette*, vol. v., new series, p. 402.]

* Subsequently an old disease of the tibia showed itself, and Mr. Hawkins trephined the bone to give exit to the contents of a large abscess in its head, which could not discharge itself, and began to affect his health.

DISSECTION OF AN UNUNITED FRACTURE OF THE BONES OF THE LEG.

THE patient was a girl, 10 years of age, who had broken the leg when two years old, so that it had been ununited for eight years; or, possibly from an imperfect account, it might have united the first time, and have broken a second time in the same place two or three years afterwards. The lower part of the limb was quite flexible, and appeared to have scarcely grown at all since the accident, as the limb was in a state of atrophy, being four inches shorter than the sound one, from the trochanter downwards, of which three inches were lost in the length of the leg, from the knee to the foot; the foot, also, was about an inch and a half shorter than the other, and the circumference of all parts proportionately diminished by the want of growth.

Being perfectly useless, and the condition of the limb, after such a length of time, affording no possible chance of union, the leg was amputated.

On examination of the preparation, the lower end of the tibia, when about three inches above the ankle, might be seen to project considerably in front of the upper portion, the ends being rounded off; the lower end of the fibula was twisted in front and united to the lower end of the tibia; the two extensor muscles, and the tibialis anticus, lay to the outside of the lower end of the fibula, and the peronei muscles were somewhat twisted in front of the outer malleolus. The substance intervening between the fractured ends of the bones, was a tough kind of fibro-cellular substance, without any attempt to form new bone, and without anything like a false joint, the two broken ends being in fact nowhere in contact with each other.

[*Pathol. Trans.*, vol. ii., p. 253, May 20th, 1850.]

REMARKABLE ALTERATIONS IN SOME JOINTS IN A CASE OF DISTORTION FROM RICKETS.

THAT the relative size and perfection of the different parts of an animal body depend in great measure on the due exercise of their respective functions, is a fact in physiology too well known to require illustration. In no structure, however, is this phenomenon more striking than in the different joints; so that every surgeon is familiar with the fact of the formation of new joints in cases of ununited fractures, or unreduced dislocations, and with the filling up of a socket, and the degeneration of the ligaments of a joint which is no longer used. The following case illustrates very forcibly, the accommodation of joints to new circumstances, to which I allude.

A middle-aged man was brought into the dissecting-room in Great Windmill Street, distorted to such a degree, that he appears to have used crutches for a great length of time, and to have employed his feet only to support the weight of his body, while the ends of the crutches were brought forwards in walking. The spine had a double lateral curvature, in which the usual difference of thickness was observable from the pressure on the sides of the bodies of the vertebræ; the pelvis was twisted, and one side lower than the other; all the long bones were distorted and curved in different directions, and the growth of the different parts of each bone very irregular. The feet and hands were also curved, so that he could only have walked on the outside of his feet, and must have had a very imperfect use of his hands from the twisting of the fingers, and the ankylosis which had taken place between several of the phalanges in a disadvantageous position. In short, he must have laboured under the disease of rickets early in life, to a very high degree. But I wish more particularly to describe the changes which the joints of the shoulders, of the hips, and of one knee, had undergone, so as to illustrate my first remark.

Probably while this man suffered from rickets, his left knee had been dislocated, in such a manner that the tibia rested on the fore-part of the femur. In order to accommodate the bones to their new position the back part of the tibia had been absorbed, so that a flat surface had been formed rather behind than on the superior surface of the head of the bone. The condyles of the femur had been altered in size, and the lower end of the bone had been absorbed to receive the head of the tibia on its fore-part instead of on the condyles, presenting to a certain extent a hollow socket in this situation, which was deepened still further by the growth of a large knob of bone from the surface of the shaft of the femur, above the part with which the tibia was principally in contact. The surfaces of the bones were covered with new formed but imperfect cartilage, and a perfect synovial membrane, with ligaments of considerable strength, surrounded the whole of the extremities of the bones.

Thus a new joint had been formed strong enough, as it would seem, to support weight; but as the ends of the two bones no longer touched each other, but the anterior surface of one was in contact with and overlapped the posterior surface of the other, all flexion of the joint must have been prevented, and the limb must constantly have been in a state of extension. From this circumstance another deviation from the natural appearance of the parts was observed in the patella. The office of the patella and of the sesamoid bones is to assist the action of those muscles to the tendons of which they are attached, by altering the direction in which they act; thus giving them new power, in proportion as they begin to lose their strength by the shortening which their fibres have undergone in contracting in their original

direction. Thence arises the size of the patella, corresponding to the power of action required in the extensor muscles of the knee-joint. But in this new joint less strength was required in the extensor muscles, which did little more than balance the leg while the person was standing, and they always acted in one straight line only. Accordingly the patella had never grown since the period of the disease or injury which had produced the dislocation, if, indeed, it had not actually diminished in size; at all events it was not more than a quarter of the size of the patella of the other limb, where the motions of the joint remained perfect.

In the next place the hip-joint had undergone a remarkable change in its formation. This person only used the legs to stand upon, and did not turn the femur in the socket, nor rotate the pelvis upon the femur. He required, when sitting down or rising from his seat, to bend and extend the hip-joint, and when walking, his legs were swung forwards by the flexor muscles of the hip, but there was not that rotation of the pelvis and femur upon each other, which is necessary when a person advances each limb alternately. In short, only the motion of a hinge-joint was now required, and the enarthrotic joint of the hip was therefore nearly converted into the form of a hinge-joint. On each side of the body the neck of the femur was absorbed, so that the trochanters and the head of the bone were close to and level with each other; the neck being required to stand out freely so as to allow of extensive circular movements in a natural hip-joint, but this form not being necessary in the more limited motion which the joint now performed, the head of the femur no longer formed about three quarters of a circle, but was flattened and widened, so as rather to form a small segment of a very large circle. The acetabulum was at the same time wider than usual, to correspond with the increased size of the surface of the femur, and the cavity much more shallow than is generally met with.

The last remarkable circumstance I observed was in the shoulder-joint. The employment of crutches necessarily separates the head of the humerus from the side of the body, and pushes it outwards and upwards, so as to increase the pressure of the bone against the acromion. The shoulder-joint was, therefore, much more lax, and the capsular ligament more extensive than natural, and there were a great number of enlarged and thickened bursæ between the head of the bone and the acromion, which were filled with a quantity of thick gelatinous fluid, to obviate the inconveniences arising from the great pressure produced by the employment of the crutches.

[*Medical Gazette*, vol. i., p. 269, Feb. 9, 1828.]

CLINICAL REMARKS

ON

A RARE FORM OF DISEASE OF THE KNEE-JOINT.

Mr. Hawkins began by saying that he wished to direct the attention of the gentlemen present to a case now in the hospital, which he imagined was an example of an unusual affection of the knee-joint (of which, at least, he only recollected having seen four other cases), and which was well deserving of their examination, since two of those four died; and although in many respects resembling inflammation of the synovial membrane, it was, in fact, essentially different, and did not yield to the ordinary remedies employed in synovial inflammation.

It is the case (Mr. Hawkins said) of William Everitt, 20 years of age, who was admitted on the 1st of the present month (July). He stated that on the morning of his admission, while following his employment as a groom, he first felt pain in his left knee, which rapidly increased, so that in *two hours* the joint was so painful and swollen that he could work no longer. When he was brought here, his extremities were covered with urticaria febrilis, and he suffered so much from fever that the house-surgeon placed him under the physician's care, and I have not seen him till the day before yesterday. I need hardly observe, that this acute urticaria is only an accidental coincidence, and has nothing to do with the disease of the knee. The joint, I understand, was at that time very much swollen, and so painful that he could scarcely bear the skin even to be touched. He attributed the attack to a kick he received a month previously from a horse, but this gave him no pain or inconvenience; and the appearance of the knee is so exactly the same as in the other cases which I have seen, that I have no doubt the kick was not the cause of the disease: in fact, all our patients are fond of attributing any local affection to some previous local injury.

Now, to explain to you what I believe the case to have originated in, let me mention to you the previous cases which I have seen.

The first was a young woman, 22 years of age, who was admitted on the 26th July, 1827, under the care of Mr. Brodie, with considerable enlargement of the knee-joint, and exquisite pain occasioned by the slightest pressure, and with severe symptomatic fever. The pain and swelling had appeared suddenly the day before, without any previous shivering or any injury. Neither had she been particularly exposed to cold or wet, but she had for a month or more been subject to attacks of rheumatism in the elbow and shoulders, and had been leading a life of prostitution. The symptoms and appearance of the joint were not precisely those of rheumatism of the synovial membrane, but they struck Mr. Brodie, whose patient she was, and

all of us who saw it, as something unusual, and the case was watched with great interest. On the 28th she was put under the influence of calomel and opium, with much relief ; but she continued to suffer from ulceration of the cartilages of the knee, for which blisters and issues were used, but without much benefit, till October 16th, when she was suddenly seized with a severe rigor, which lasted for an hour, and was followed by profuse perspiration. She had severe purging and vomiting, and repeated shiverings. The next day her extremities became cold, and she died in the evening of the 17th. Such are the notes of the Museum book, and here is a preparation of the joint and a drawing of it, which was taken at the time. On examination of the body, some slight peritonitis was found, to which the fatal symptoms were no doubt owing ; since, on cutting into the knee-joint, not a particle of purulent matter was found, and the knee-joint seemed much reduced in size. The cartilages, however, of the femur (particularly the inner one), of the head of the tibia, and of the patella, were ulcerated extensively, and some blood was effused into the joint, doubtless from the ulcerated surfaces. The periosteum of the femur peeled off more easily than natural, and the bone itself appeared more vascular than usual.

By one of those coincidences which are so often observed with rare occurrences, another case of the same kind was admitted soon after this, under the care of Mr. Keate, which came on in the same manner, and presented nearly the same appearances ; and, after much suffering, this patient also died. On examination of the joint, the cartilages were extensively ulcerated, but there was no purulent matter in the joint, although a good deal of matter was found nearly the whole length of the thigh among the muscles near the bone. The periosteum of the femur was much thickened and condensed, for some distance above the knee, and the bone was vascular, as in the former case.

The third case was that of a patient of Mr. Rose's, soon after the others, which got well, though the ulceration of the cartilages caused, I understand, permanent ankylosis of the joint ; but I am not acquainted with all the details of the case.

The fourth was a young woman, 25 years of age, who was admitted into the hospital, under my own care, May 12th, 1830. My notes are these :— She said she had been suddenly seized, a fortnight before her admission, with acute pain and swelling of the right knee, which has been cupped and leeched without benefit. The last two days she has had repeated rigors. Her countenance is flushed, and there is an expression of great distress and anxiety. The tongue is dry and a little brown in the centre ; the pulse very rapid and weak ; and she is restless and sleepless to a great degree. There are occasional catches in the limb. The synovial membrane is filled with fluid, but the cellular membrane around, for some extent, is cedematous, and crepitates

in some places. The tenderness is exquisitely great, and she cannot bear the least pressure or motion. At first leeches were used, the joint being much too tender to bear cupping, and colchicum was given in considerable quantity, by which the fever was slightly lessened, but there was not the least improvement in the state of the knee. She was then ordered a grain of calomel, two of antimonial powder, and a third of a grain of opium every six hours; the effect of which was immediate. The very next day, the report says there was less pain and less swelling; and when she had taken this medicine for rather more than a week, the notes say, the pain and swelling have very much subsided, and the patella can be freely moved and pressure made on the synovial membrane without pain. There is now no fever, and there was last night, for the first time, no starting. Pressure of the tibia upwards, however, or of the patella against the femur, gives much pain. In short, there remained ulceration of the cartilages of the knee-joint. Some blisters were then used, and afterwards an issue was made on the side of the joint; under which the disease was finally cured, and the patient left the hospital with tolerable motion of the joint.

Now these cases will show us, I think, in what respects the disease differs from synovial inflammation; it is in the circumstance of there being acute inflammation of the periosteum of the femur, which is probably the commencement of the disorder, and the affection of the joint ending in ulceration of the cartilages secondary to this, or at all events the concurrence of the periostitis renders the case materially different from one of ordinary ulceration of the cartilages, as well as from one of synovial inflammation. In both the fatal cases, the alteration in the periosteum was evident after death, in one with suppuration, in the other not; and if you examine the joint in the case now in the house, you will perceive the enlargement and thickening of the periosteum for about one-third of the femur, with great pain above the joint when the bone is pressed upon. It is evident, also, that the disease is of a rheumatic character, for in all of the patients, rheumatism was present in other joints. In Mr. Keate's case, the inflammation seemed to have attacked the knee first slightly, then rheumatism appeared elsewhere, before the peculiar and fatal inflammation of the femur and knee-joint finally settled in those parts. In my own patient, a somewhat acute attack of rheumatic inflammation came on in both upper extremities after the disease was almost cured in the knee, but then it was of the ordinary character of synovial inflammation; the bones were not affected, and it yielded readily to colchicum, which had no effect whatever upon the disease of the knee previously.

This, then, being my opinion of the nature of the disease, let us now see how you are to distinguish the kind of disease when you meet with it. The disease, you will observe, comes on very suddenly, and in our present patient,

two hours produced great swelling and most acute pain and fever : ordinary rheumatism is, however, sometimes very sudden and acute, though the swelling is not often so immediate as in these cases : so that it is chiefly in the local signs that you will recognize the peculiarity of the cases. The pain and tenderness I have already mentioned are found in the bone above the joint as well as in the joint itself, and both are most severe, so as in a short time to cause an expression of great suffering in the patient's countenance, with a tendency to the dry and brown tongue and weak pulse of typhoid fever ; though of course this circumstance differs in different individuals. Neither will you observe them in the present case, as the severity of the disease is a good deal mitigated. You will still, however, perceive something of the peculiar kind of pain which is present : the patient cannot bear the least jar or motion of any kind, either of the foot or any part of the limb. The tenderness is very great even in the skin : Mr. Hicks's description of what he observed when this patient first came here is quite accurate ; that the skin seemed quite as tender as in an hysterical girl ; that is to say, not merely does pressure of the synovial membrane or of the periosteum cause pain, but the least touch of the skin, which can scarcely have reached the diseased parts at all, is also attended with much pain. You may still see a difference in the form of the swelling in the parts ; there is not merely swelling of the synovial membrane, but this is in a great measure concealed by an effusion of lymph and serum into the cellular texture, rendering the enlargement more diffused than in common disease of the synovial membrane or cartilages, extending for some way above and below the joint, and having a puffy elastic feeling, with a little oedema in some places ; and in my former patient, a distinct crackling sensation was perceived, from the deposition in the cells of the cellular texture. You will observe, too, in Everett's knee, a very peculiar, glossy, white appearance, which you do not see in the more common affections, in which either the colour is unaffected, or if the person is not fat, the skin partaking of the inflammation of the synovial membrane, is actually somewhat redder than usual : in this affection, on the other hand, the skin seems to contain even less blood than usual, so as to produce this almost marble whiteness. Then, again, you have at a very early period, sooner than in common ulceration of the cartilages, and sooner than in ordinary rheumatic inflammation of the synovial membrane, that twitching and starting of the limb, that defined and gnawing pain, and that acute pain on pressing the cartilages of the bones against each other, which indicate ulceration of the cartilages. This arises partly, perhaps, from the acuteness of the ulceration, and partly from the extent of surface which is ulcerated, which you can see in the drawing and preparation is very considerable ; while, if common rheumatism affects the cartilages of a joint, it is commonly milder in its progress, the symptoms are more readily mitigated, and

the disease more easily cured. The last peculiarity I need specify is the urgency of the constitutional symptoms, the most severe febrile state being almost immediately established. The fever is at first inflammatory, but there is very soon a tendency to the brown tongue and weak pulse of typhoid fever, passing off at last into hectic, when the state of ulceration and the formation of abscesses bring the joint into the condition in which it is found in ulceration of the cartilages generally. It is then during the first invasion of the fever that it strikes you as unusually severe; there are, even at this time, frequent and severe rigors, with copious perspiration; it seems as if a foul and sloughy abscess was forming, though the examination of Mr. Brodie's case, and the cure of Mr. Rose's and my own, show that these symptoms may be unaccompanied with any suppuration.

Now then as to the treatment of these cases. The disease resembles synovial rheumatism; but you will see the necessity of distinguishing it from inflammation of this membrane, since the remedies which will cure nearly nineteen out of twenty cases of synovial inflammation, have no power over this case, or if they do check it, the disease yields to them very slowly and imperfectly. I have told you that this disease, perhaps, originates in, or at least is accompanied by acute inflammation of the periosteum of the femur: you know that the only remedy on which you can rely for subduing acute periostitis is mercury, when you are able to exhibit it. Again, the disease is rheumatic, but it is rheumatism of the *fibrous* texture of the periosteum, and not merely of the synovial membrane of the joint: you know, again, that this form, fibrous rheumatism, as it is called, yields commonly more readily to calomel and opium, than it does to those means which are sufficient for synovial rheumatism.

I strongly recommend you, therefore, in the next case you meet with, to employ calomel and opium almost directly in the disease, so as moderately to affect the gums, giving one or two grains, with a quarter or half a grain of opium, every six hours, and continuing it, in more moderate quantities for some little time after the severity of the symptoms is subdued. Combining this with some antimony, as in my case, you can begin the employment of it even when the fever is considerable. It was to calomel and opium that Mr. Rose's patient owed her recovery. Mr. Brodie's was also much relieved, though she ultimately died. In my own case which I have detailed to you, it acted like a charm. After repeated leeching and colchicum had been employed without the least mitigation of her suffering, the very next day after these medicines were left off, and calomel and opium were used, there was a decided improvement, and in less than a week all danger was over of her sinking under it. As I did not see the present patient till a day or two since, I cannot compare his present condition with that in which he was when he first came to the hospital. I understand, however, that he has,

after the first few days, been gradually though slowly improving ; but still the disease is by no means cured, and the antiphlogistic plan has been completely tried in his case, as he has been bled in the first instance for his urticaria, and has had nearly 100 leeches used, with colchicum, &c. ; and this treatment was commenced the very same day that the disease began. Calomel and opium have been commenced by Dr. Wilson, and under this, I think, we shall witness a more rapid amendment than under the previous treatment.

On the 24th I saw him for the first time, when the symptoms were still sufficiently marked for you to recognize them, and to observe the several peculiarities which I have pointed out to your notice.

Of course, while I recommend more especially the calomel and opium, which Everitt is now taking, I do not mean that you are not to use leeches and cold lotion, and similar local means, but that you should trust most to the use of the mercury in subduing the violence of the disorder.

But now comes a second indication in the treatment. The severe inflammation of the bone has subsided, we will suppose, but there remains a serious disease of the joint. The starting and muscular twitches, the severe pain at night in the joint, the pain on pressing the articular surfaces together, still continue, although the fever and general pain of the limb, with the swelling and puffiness, and glossy white appearance of the joint, and the tenderness of the femur have gone off ; that is to say, there remains ulceration of the cartilages of the joint, over which, you are aware, counter-irritants alone have real power. You must then, in this second stage of the disease, keep the joint perfectly at rest, and employ blisters and issues till these symptoms are gone. In the ulceration of the cartilages which follows synovial inflammation, blisters alone are usually sufficient ; but the ulceration in the present form of disease is more rapid, and you may see from the specimens that it is extensive ; so that probably an issue on one or both sides of the joint will generally be required. My former patient had ulceration apparently between the patella and the surface of the femur, and also between the inner condyle of this bone and the tibia ; and while several blisters occasioned no diminution of the pain, an issue on the inside of the joint was sufficient to conquer it, and she left the hospital I believe with a useful limb, the motion of the joint having been preserved. In Mr. Rose's patient, on the other hand, although the disease was conquered, I understand that the joint became immovable after she left the hospital, in consequence of ankylosis.

You may expect me, perhaps, to say something relative to the future progress of Everitt's case ; but, in truth, I scarcely feel certain of the state the parts are now in. It is clear, I think, that some ulceration is going on, both where the tibia and femur are in contact, especially on the inside, and also where the patella touches the femur. It is evident also that there is still a good

deal of inflammation in the lower part of the femur, which you can feel enlarged and tender (or rather the periosteum is so), for some inches above the joint. But from the degree and kind of swelling which still remains, it is by no means certain, I am afraid, that suppuration may not take place, if it has not done so already, as it did in Mr. Keate's case. If so, the result is of course very doubtful, and he will have a great deal to go through, even if he recovers at all; otherwise we shall have to look to the time when the present line of treatment can be left off, and the disease becomes sufficiently confined to be treated as ulceration of the cartilages alone by an issue. At all events, the case well deserves your watching it to its termination.

[Since the lecture was given, the patient has improved a good deal, having continued the calomel and opium.—Aug. 6.]

[*Medical Gazette*, vol. xii., p. 652, August 10th, 1833.]

CLINICAL REMARKS ON WOUNDS OF JOINTS.

June 15th, 1847.

PUNCTURED wounds, independent of hæmorrhage, do not always heal well, and are attended with points of interest. There is a little boy in Winchester Ward, Thomas Pragnell, æt. 15, who was admitted on May 10th, with "abscess over the inner side of the knee-joint, and there is a discharge of thin fluid like synovia, mixed with pus. There is considerable fulness and redness over the inner side of the joint. It was caused by the point of a lead pencil sticking into it four days ago. He has had rigors for the last day or two. The abscess was laid freely open; it does not appear to be connected with the joint, but is quite subcutaneous."

This case illustrates two points connected with the treatment. It was simply an instance of punctured wound not healing, because, as the notes afterwards inform us, there was a small piece of cedar remaining in it. But there is also a note of the oozing of a fluid like synovia from the opening. When an appearance of this sort takes place, you must not at once conclude that it is a proof of an opening into the joint existing. The fat in the living body is in a fluid state, and when its cells are ruptured it runs out; and when mixed with serum, or blood, appears very like the oily fluid you see escape from a wounded joint. This was probably what took place in our patient. I was obliged to lay the abscess open for a second circumstance. When an abscess is situated near the knee, although the opening in the skin may be free, yet the projection of the patella, or convexity of the head of the tibia, may interfere with the ready escape of the pus, and a few drops thus confined may cause an abscess to extend all round the limb. This is to be

guarded against by freely laying it open, and our patient is now getting well, with a healthy granulating wound.

There is another case of wound near the wrist-joint now in the house, to which I will direct your attention.

James Heath, æt. 46, was admitted into Oxford Ward, on June 4th, with "a contusion of the left forearm and hand, with a small wound over the wrist, from which there had been some hæmorrhage before his admission, and from which, when he first came into the hospital, synovia was escaping, as if from the joint between the first and second rows of the carpal bones. Slight grazing of the hand and wrist. No crepitus to be felt. He has been accustomed to drink very much." Here, too, there was apparently synovia escaping, but it was open to the same source of fallacy as the last case. It is better not to examine such wounds near joints too carefully; you do no good by satisfying yourself whether the wound extends into the joint, and you do harm by the irritation produced by the probing. If you suspect that a joint is injured, you must watch the case carefully, and let your treatment be more strict, and rest more carefully enjoined:—perhaps the wound heals, so that you do not know whether it went into the joint or not. Supposing inflammation and suppuration to occur, an incision must be made early, to remove tension, and check the inflammation,—a proceeding equally necessary whether the joint be injured or not.

In this case, the notes for the following day tell us, "there was great pain and swelling of the arm, with much tension and pain on the inside of the wrist; tongue tremulous and white;" showing, you see, an unhealthy state of system, arising from his intemperate habits; and I increased his diet, and added some porter,—a proceeding which, in such cases, is calculated to diminish rather than to increase the inflammation, particularly if combined with a mildly alterative plan of treatment.

The tension which the notes speak of was rather œdema, and I did not think it necessary to make any incision; and, in fact, it soon subsided under fomentations and chamomile poultices, with stimulant ointment to the wound. Suppuration has since taken place, with the appearance of being mixed with synovia, and in all probability the joint has really been opened. The wrist is free from the violent inflammation which sometimes attends the opening of a large joint, but very likely the inflammation may cause destruction of the cartilage, and a stiff joint; and, as long as the wound remains, there is always danger of fresh symptoms coming on, as of a diseased joint, with the chance of the wrist itself inflaming, or chronic inflammation being left, ultimately requiring the loss of the limb.

[This patient escaped these dangers, and the wound shortly healed.]

[*Medical Gazette*, vol. v., new series, p. 409.]

CLINICAL REMARKS

ON DISEASES OF THE TARSAJ JOINTS.

June 23rd, 1846.

1. Relaxation and Inflammation of the Tarsal Joints.—2. Caries of Tarsal Joints—Excision of the heads of the bones.—3. Disease of Tarsal Joint, and of the Great Toe — Chronic Abscesses of Arm and Neck—Excision and Amputation.

I WILL next direct your attention to two cases of disease of the joints of the foot, which is not uncommon, and the consideration of which is of some importance, as you will be consulted about it in all classes of society in different stages of its progress.

The arch of the foot consists of a series of elastic joints, which serve, like the complicated joints of the spine, to diffuse among them all the effects of jarring and straining in the exertions of walking, running, leaping, and so on, which would be seriously felt by a single joint, and would, without the elasticity which is thus produced, occasion mischief to the viscera, and even to the spinal marrow and brain. Now, it is very common in weak persons, especially in children, for the ligaments of these joints to become relaxed, so that the sole of the foot is flattened, and little or no arch remains, the under surfaces of the navicular and cuneiform bones at the top of the arch sinking down so as nearly to touch the ground ; the consequence of this is, that the jarring of the motions of the body is constantly felt, and the patient's gait is awkward, and there is pain and inflammation, with lameness, from time to time, according to the variations of the general health. A gentleman was under my care, not long since, who suffered so serious an inconvenience from this state of things that he was scarcely able to do duty for any length of time, for two years, and was almost obliged to quit the army before he got well.

But the affection soon spreads to the internal lateral ligaments of the ankle-joint, because the flatness of the arch on the inside of the foot throws down the inner malleolus, and alters the angle of the foot with the leg, so that there is a constant strain on the internal ligament ; every step makes the tibia approach the ground, and bend the ligament inwards, which adds to the awkwardness of the patient's walk ; there is, however, very often a similar straining and giving way of the internal lateral ligament in other cases, without any flattening of the arch of the foot.

But this is not all : a young lady was seen by a medical man, in consequence of her lame and awkward walking, and was ordered a knee-cap for a weakness and straining of the internal lateral ligament of the knee-joint, and she had also some lateral twisting of the spinal column, which, arising from

constitutional debility, was made worse by the giving way of one leg in walking; in fact, the turning and twisting of her limbs, and the awkward movements of the whole body, were so great, that her mother was almost ashamed of letting her be seen going out; the knee-cap was very right and proper, but it did nothing for the original cause, which was the flatness of the foot; this made the ankle sink inwards; then the strain on the knee was such as to increase the natural angle between the leg and thigh, and finally even the spinal column was distorted; and the greater part of the mischief was conquered by supplying an artificial arch to the foot.

When the tarsal ligaments and the lateral ligament of the ankle are simply weak or relaxed, without pain or inflammation, you must raise the centre of the arch of the tarsus, and take away the strain upon the ligaments which the weight of the body occasions, till they have had time to contract and to regain their natural elasticity and strength. This is to be done by getting an intelligent shoemaker to fix carefully in the inside of one or both boots, a sufficient thickness of indiarubber, or cork, or leather, to raise the inside of the sole of the foot to its proper height; the support must, therefore, reach from the os calcis to the ball of the great toe, being thickest in the middle of its inner margin, and being made gradually thinner towards each extremity, and towards the outside, where it need only reach about half-way across the bottom of the foot. If the internal lateral ligament of the ankle is much weakened, you may also have a piece of thick and nearly inflexible leather fixed in the leg part of the boot, between its inner and outer layers, of whatever material they happen to be, taking care that it is not so placed as to press upon and hurt the projecting part of the inner malleolus. In most cases, however, I prefer having an artificial arch made of iron, placed between the layers of leather forming the sole of the boot; this is better adapted to the form of the arch than cork or other material within the shoe, and it is not visible externally. The instrument makers have used it extensively since I first ordered boots of this kind many years ago. While mechanical support is thus given, the feet and ankles may be strengthened by friction with any liniment, and by bathing in salt water. As the constitution is also generally in fault, the system must at the same time be strengthened by the use of steel and the shower-bath, or by sea bathing, and other forms of tonic remedies.

If there is pain and inflammation in the part this must first be got rid of by rest, and cold applications; and, if it is considerable, a small blister must be applied to the inner part of the foot before the patient is allowed to walk about: but I do not remember having ever found this necessary except in adults.

But at last, when these cases are neglected, the inflammation of the ligaments spreads to the joints; they also become inflamed, and the synovial

inflammation terminates in ulceration of the cartilages and ankylosis, if the disease is stopped, or else in the formation of abscess in and around the joints, and in caries and necrosis of the bones.

The situations in which the joints are commonly affected are the joints of the inner cuneiform bone with the metatarsal bone of the great toe, and that of the metatarsal bone of the great toe with the first phalanx, and sometimes both are diseased in the same person. I have thought that the latter joint is more often affected in females, and have been inclined to attribute this to their different mode of walking, the thin-soled shoe allowing of much more play of this joint, and leading them to walk, as it is called, more on their toes than in ourselves, in whom more strain is consequently thrown upon the arch. I am not certain, however, that there is such greater frequency as to make the observation really well founded.

Of the advanced stage of this disease of the joints you have had an example in the case of John Alexander, 23 years of age, who was admitted on March 11th. He is a groom, in whom the exercise of riding keeps up the same strain on the ligaments of the tarsus which much walking will do: the disease began about three years ago from an accident, his horse having fallen with him, his left foot being under him. The notes say that it caused him little trouble till about five months ago, when it again became inflamed without any evident cause, but I understood he had felt the effects of the injury from time to time after exertion. This did not prevent his usual occupation till three weeks ago. He has had leeches and blisters applied. There is not, nor has there been, much pain in it. On his admission it was evident that the cartilage between the internal cuneiform bone and the metatarsal bone of the great toe had been absorbed and there was partial ankylosis between them, with some thickening of the soft parts, which obscured the arch of the foot. You have seen the disease make progress since that time, in spite of remedies, till I was obliged to operate on it last Thursday.

I tried to subdue the inflammation of the part by rest, with blisters, of which he had two, but they only relieved him at first; and on the 3rd of April the notes say, he has less pain, but more fluid: and on the 6th I opened it to let out a little matter. On the 27th I was obliged to enlarge the opening, and again on May 1st, from thickening around the joint, with more suppuration. On the 7th of May it is stated that there was some puffiness on the dorsum of the foot, and as this increased I was obliged to open it on the outer part of the foot, matter having apparently formed and passed beneath the extensor tendons. On the 25th a mass of fungous granulations of considerable size began to form over the joint, with a disposition to bleed occasionally, and to become sloughy, and the pain became worse, and began to affect his health, so that some operation or other was called for. I

tried at the same time to improve his health by sarsaparilla and iodide of potassium, which are useful in some cases of caries of the bones, and afterwards by bark; latterly I have only given him ammonia and opiates to relieve the irritation of the disease; and on June 8th it is noted that there was a little cough and expectoration of mucus, and pain in the left side of the chest, which still continue slightly. A state of threatened phthisis is sometimes an argument for, and sometimes against, an operation. If an operation is severe, and causes much constitutional disturbance, undoubtedly the disposition to form tubercles is much increased by it, and consumption therefore often makes rapid progress after an amputation, or other great operation; on the other hand, an irritating local disease is itself a cause of consumption, which is hastened by whatever produces debility or other deterioration of the general health, and an operation which removes irritation may retard the progress of phthisis instead of aggravating it: it is a chance which you cannot always calculate before hand, but much irritation on the whole is worse than a moderate operation, and we therefore determined on its performance in this case.

It was difficult to know exactly how far the disease had spread, though the quantity of soft swelling on the back of the foot made it not improbable that it was no longer confined to the joint of the internal cuneiform, and the metatarsal bone of the great toe, and the proximity of the other joints to this makes inflammation easily spread from one to the other. When there is a little piece of necrosed bone, or caries, confined to the inside of the foot, I have often removed the disease with success, and on consultation it was determined that we would endeavour in this case to save the foot by excision of the diseased parts. The operation on the 18th June is thus described in the notes:—An incision being made in a linear direction along the junction of the middle cuneiform and metatarsal bone, a probe was introduced, and the corresponding surfaces of these two bones being found carious, and their surfaces exposed, an incision in the same direction as the preceding was made through the original wound on the inside of the foot, and the two were connected together by a transverse one, forming two flaps, which were partially dissected from the bones, and the surfaces of the internal and middle cuneiform with the corresponding surfaces of the two metatarsal bones, were removed with a pair of bone forceps. The bleeding was restrained with difficulty, from the deep passage of the posterior tibial artery among the tarsal bones; three ligatures were used, and a piece of blue lint was placed in the wound.

When I found that the second joint was diseased, and possibly the third was not sound, I felt half inclined to remove the foot in the line of the cuneiform and cuboid bones; but we have, as you have seen, given the man the chance of the part becoming filled up and consolidated, so as to assist in bearing the

weight of the body better than a stump alone ; the arch, of course, becomes shorter and somewhat weakened, and an artificial support may be required, but if it succeeds this is better than only the heel to walk upon. There has been very little disturbance from the operation, and the notes of yesterday say that the granulations of the wound seem very healthy ; there is less pain since the operation than before, and his health seems to be improved, but he still has slight cough, and pain in the chest.

[Subsequently, however, the progress of the case, both as to the chest and the appearance of parts, has not been quite so favourable, making the ultimate result doubtful.]

I confess I do not feel very sanguine about this case, in consequence of the patient's very bad state of health ; but if some other joints do become diseased it must be our object to observe it early, so that the foot may be removed either along the line of the present operation or between the navicular and cuneiform bones, according to Chopart's proposal, before the whole thickness of the navicular bone becomes affected ; because if the joint of the navicular bone with the astragalus is diseased, there is little chance of its not implicating the ankle-joint also, so as to require amputation of the leg.

In the other case you have the same joint affected on one foot, and the joint of the metatarsal bone with the great toe on the other foot. This patient, Maria Patch, 19 years of age, was admitted May 6th, with caries of the metatarsal bone of the great toe (the left). The probe passed into the sinus shows the joint between the metatarsal bone and first phalanx to be destroyed, and a portion of the phalanx to be exposed, and partly dead. There is much œdema and thickening of the tissues around the sinus, from which grows a mass of large fungoid granulations. There is great discharge and aching pain in the part, and a good deal of thickening of the parts composing the ball of the great toe.

There is a small sinus in the right foot, which leads to the internal cuneiform and metatarsal bone, and to the joint between them, but the disease is not so far advanced as on the other side. There is some thickening around the sinus, but not much pain. On the outer side of the right elbow there is a small circumscribed abscess about the size of a walnut, sensibly fluctuating ; and at the back of the neck is an irregular oblong fluctuating abscess, both of which have been forming gradually for the last two months. Seven months ago, without experiencing any accident, she had swelling of the inner side of the left foot, and in two months an abscess formed and burst, and has continued to discharge since that time : she has not seen any bone come away. The right foot became affected about the same time. She is of a pale and unhealthy aspect, and is a servant of all work, and came from the country not many months before the disease began.

In this latter circumstance I believe you see the reason of her illness.

Having changed the purer air of the country for an underground kitchen in London, with incessant work upon her feet, a state of blood was produced which made the vessels of different parts of the body disposed to form some local inflammations, particularly in one originally of a strumous constitution, likely as well as the last patient to have phthisical tubercles developed in the lungs.

I first tried to improve her health by giving her sarsaparilla and iodide of potassium, with some porter and good diet, and have lately changed this medicine for some bark and mineral acids, but without much alteration for the better. As the abscesses were not red or inflamed, I also gave them the chance of being absorbed, (if the proportion of pus in the fluid was not great,) by applying the strong iodine solution; and on May 18th the note says, both abscesses have much diminished; but this amendment did not continue, and on June 1st, that on the neck having increased in size, I opened it, and let out some pus, with flakes of lymph, and on the 5th I also let out some sero-purulent fluid from the abscess on the elbow: both of them have since contracted, and are probably healing. The disease of the feet has also got somewhat worse; the mass of fungous granulations on the left foot has increased, and there has been more irritation of the right foot, obliging me to enlarge the opening a few days ago, and had it not been for the intense heat I should have operated on her also last Thursday, but have postponed it till she will, perhaps, not be so much exhausted by it as she would be now.

On the right side I shall endeavour to remove the carious surfaces of the cuneiform and metatarsal bones, taking away however no more than is actually diseased, in order not to weaken the arch more than can be helped; and as the caries of the bones seems to be certainly confined to a part of the joint, we are in hopes the excision will be successful, though one can never be certain of the event, as the other joints are so close to it as easily to become affected. On the left side I must take away the whole of the toe and the extremity of the metatarsal bone, of which a very small part is diseased, and the more of it can be left the better, as of course the arch of the foot is weakened in proportion as it is shortened. It is no use, however to attempt the excision of this joint, as you can do with advantage for the joint of the thumb, because the great toe would subsequently be too weak to bear any of the weight of the body in walking, and is, in fact, only an encumbrance, when thus left loose, and without firm ligamentous connections.

[The amputation of the great toe and head of the metatarsal bone of the left foot, and the excision of the articular surfaces of the cuneiform bone and metatarsal bone of the left foot, have subsequently been performed, and the patient seems to be going on extremely well.]

[*Medical Gazette*, vol. iii., new series, p. 310.]

CLINICAL LECTURE

ON VARIOUS DISEASES OF THE KNEE-JOINT.

1. Acute Synovitis of Knee and Abscess, from Needle.—2. Crepitating Synovitis of Knee.—3. Gonorrhœal Synovitis of Joints, and Ophthalmia.—4. Rheumatic Synovitis; Ulceration of Cartilages; Extension by Screw.—5. Synovitis with Serofula.—6. Serofulous Abscess of Knee—Cure.—7. Disease of Knee—Amputation.—8 & 9. Chronic Inflammation of Ligaments of the Knee.—10. Hysterical Pain of Knee.

IN making clinical instruction auxiliary to, and yet different from, your systematic courses of lectures, it is sometimes useful to bring under your notice several examples of the same disease for comparison with one another, that you may see how the disease is modified by constitution or other circumstances; at other times it is instructive to group together a variety of different diseases of the same region or texture; and accordingly, as there happen to be very many joint cases under my care at the present time, I propose to pass under review a number of cases in which the knee-joint is affected, in different ways and from various causes.

1. First, let us take the case of Thomas A —, a boy aged 14, who was admitted a month ago (Feb. 5), who tells us that about Christmas he ran a needle into the knee, just above the patella, on the inside, where a mark is pointed out as the situation of its entrance, and he asserts that the needle still remains in the joint, but it cannot be felt. On his admission the synovial membrane was greatly swelled with fluid, bulging irregularly in various directions, with redness of the skin in several places, giving it the shape which medullary disease not unfrequently assumes; the joint was also painful and tender, and the boy was emaciated, with an anxious expression of countenance; he had a quick and weak pulse, and a dry and glazed tongue, but no shivering or perspiration.

He told us that the joint began to swell and to become painful very soon after the puncture, and, in fact, the part appeared to be affected with acute inflammation, probably containing pus, and making the loss of the limb not at all unlikely.

You may remember, however, that a week's rest, with cold lotion, and a purgative or two, with light nourishing diet, lessened the acuteness of the symptoms, and on the 15th our notes remark, that "the pain and tenderness were less, though the swelling was not less," and in order to lessen the tension and acquire more information for future treatment, I introduced a grooved needle into the joint, and let out about two ounces of semi-opaque liquid, consisting of synovia with some pus, very visible under the microscope, but less distinct to the naked eye.

This proceeding is often useful where a joint is very tense with acute

inflammation, and very safe if you take care to admit no air. If, in such a doubtful case as this boy's, you find that the fluid is almost entirely pus, it is then advisable to open the cavity freely, and by doing it thus early you prevent the serious mischief of the ulceration of the synovial membrane at its thinnest part, and the extension of the pus in the loose cellular tissue under the vasti muscles, in affections of the knee-joint. If, on the other hand, you find that the proportion of pus to the synovia is not very great, you need not open the joint further, but you lessen the severity of the disease by removing the tension and pain, and are better able to subdue the inflammation by blisters, which are not borne in such a state of tension as this boy's joint was in before the puncture. I remember one case of inflammation of the elbow-joint which I punctured in this way twice or three times, the proportion of pus being above a third of the fluid let out, in which the ligaments were so softened as to let the bones bend about twice as much as usual, and yet the joint was perfectly restored to a sound state. I would confine this measure, however, to cases of suppuration from the synovial membrane, without ulceration of cartilages; if suppuration ensues when the cartilage is destroyed, the case must end, as an abscess does, by almost inevitable ankylosis, after the pus has been evacuated.

Two days after the puncture, the note says:—Less redness; little tenderness; no pain; and accordingly, on the 17th, I began the use of blisters, with which we must endeavour, if possible, to effect a cure; a second was applied, on the 28th, over the joint itself, the first being put on the thigh, just above the reflexion of the synovial membrane, because it occasionally happens, in an acute case, that the disease is aggravated when it is applied too close to the cavity. You may now see a little diminution of the fluid, and the boy's health enables him to bear a little quina, with meat diet.

[The progress of this case was subsequently somewhat variable, and more than once threatened suppuration of the joint; then the synovial membrane got healthy, but great thickening took place, for some way up the limb, around the bone; finally, a small abscess formed on the inside, below the skin, which was punctured, and about a third of an inch of a *needle* was extracted, having, in its eye, full *two inches of thread*, which had thus been above five months lost in the joint. The boy says the rest of the needle still remains; but however that may be, the joint appears now (June) nearly well, with increasing power of motion.]

2. The next case is that of Emma D—, aged 17, who was admitted on the same day, Feb. 5th, having a peculiar form of inflammation of the synovial membrane, in which there is a crepitation in pressing the joint. I have only seen this, in a marked degree, in persons who, like this girl, are very nervous and hysterical, and complain of much pain about the joint, which is, however, not often much swelled from fluid; and not unfrequently

there is a similar crepitating fluid, as you see in this case, in the bursa below the ligamentum patellæ ; and I presume that it arises from an unusual thickness of the synovial secretion. It is not a disease of importance, but will often give you some trouble before all the inflammation and pain go away. This girl was readmitted, after she had only left the hospital a week, having had blisters applied in the three weeks she was previously under treatment. These had so far lessened the disease that I only applied a bandage about the knee, constantly wetted with hydro-chlorate of ammonia lotion ; and under this means, with the use of bark, the effusion has been absorbed, and the disease cured. Steel, and other remedies of this kind, are often necessary ; and I may remark, that you must distinguish the crepitating synovia of these cases from the sensation of loose masses of lymph often found in bursæ, and occasionally in joints ; and also from the noise produced by motion in joints in which some adhesions have formed, or in which the cartilage has become uneven and rough, when crepitation is sometimes very considerable.

3. Our next case is that of William L—, 35 years of age, admitted January 8th, with inflammation of the synovial membrane of both ankle-joints, and of the left knee-joint. It appears that about a fortnight before his admission he contracted gonorrhœa ; that five days ago his left foot became swollen, painful, and red ; that he took a large dose of aperient medicine with relief, but in the evening of the 5th his right foot and left knee became also inflamed. There was, on his admission, a good deal of purulent discharge from the urethra, and he also complained of sharp, shooting pains in both eyes, and there was a fluid discharge from them similar to that from the urethra. Our notes inform us further, that three years ago he had gonorrhœa, followed by rheumatic affection of his joints, which lasted four months, and that he has occasionally had some pain in his joints since that time.

Here, then, you have an example of a constitutional affection, gonorrhœal rheumatism, in which several joints are at once, or successively attacked, as the consequence of infection in the form of gonorrhœa, for a clear knowledge of which remarkable peculiarity of system we are indebted to Sir Benjamin Brodie, to whose work on the joints I must refer you for the details. You see that a few days after the infection his joints have become affected, and a few days after this, his eyes ; sometimes the eyes become inflamed first, and the joints afterwards ; and you may see also a similar series of attacks when the urethra is inflamed from stricture without positive gonorrhœa. You see, moreover, from the history I have read to you, that he has suffered in the same way on a former occasion, and as the instances in which gonorrhœa produces such distressing effects are rare, it is obvious that the disease must depend on some peculiarity of the constitution, which, in fact, is so very strongly marked, that individuals who once exhibit it are very

likely to have similar consequences whenever they contract gonorrhœa ; and what is of great importance to them, this state of system is such as to make it very difficult to cure it, and frequently you will be annoyed by one or more relapses when you hope you have subdued the attack.

Why the eyes should also suffer, it is not very easy to understand, for you must not suppose that it is by contact of the gonorrhœal matter ; there is, indeed, as you are aware, a purulent ophthalmia from this cause, which may destroy the eye by ulceration and sloughing of the cornea in forty-eight hours, if unchecked : so also there is an affection of the eye in rheumatism ; but ordinary rheumatic ophthalmia is an inflammation of the fibrous tissues, the sclerotic, and iris ; gonorrhœal rheumatic ophthalmia, on the contrary, is a simple inflammation of the conjunctiva, generally of a mild character, though sometimes attended, as in this patient, with moderately purulent discharge, and very simple local treatment is sufficient, with such general remedies as the more severe synovial affection requires. To trace this symptom, in our case, I may read to you that on the 10th, two days after his admission, there was no inflammation of the eyes. On the 27th, it is stated that he had "some return of inflammation in both eyes, particularly the right ; the pupils are much contracted, and the conjunctivæ congested." On the 29th, "there are several small pustules over the cornea and conjunctiva in both eyes, and he cannot bear the light." Feb. 2nd, "both eyes are better, particularly the left ;" and on the 7th, "the eyes are nearly well." Fomentation in the acute stage, and Goulard lotion afterwards, were sufficient, and he has not experienced any third attack.

Now as to the constitutional treatment of the whole case :—On his admission, on Jan. 8th, a purgative of calomel and colchicum, with Dover's powder, was given to him, followed by a senna draught ; and when I saw him on the 10th, I ordered a saline draught, with fifteen minims of wine of colchicum, and half a drachm of salts, every six hours, to which I should have added some opiate, if the pain had been as acute as it sometimes is in these cases. On the 11th, the notes say the swelling of the right knee and ankles has greatly abated, and he has little pain. On the 18th, "rather more pain in the left limb," and I ordered a vapour-bath, which, however, will not do when the pains are very severe. On the 22nd, the amendment not being rapid, I omitted his mixture, and gave him a pill containing two grains of calomel, one of extract of colchicum, and a quarter of a grain of opium, night and morning, which gave a fresh start to his cure ; and, on the 24th, the note says, "less pain, but the knee is still much swollen." On the 27th, his gums being affected, the pill was given once a day only. On Feb. 7th, although improving, the quantity of synovia in the knee was still considerable, and I began the application of blisters ; on the 12th, I gave him bark, iodide of potassium, and carbonate of potash, which is often useful in

the chronic stage of this disease, and left off the pill. On the 21st, however, after having nearly got well, there was a return of pain and swelling in the knee, and a little also in the ankles, and I returned to his calomel pill once a day, continuing the last mixture, and repeated the blister to the knee. At present you see him slowly mending, but in his weak state of constitution I dare say his convalescence will be slow. [After this, local vapour-baths were used, with much advantage, and he left the hospital on April 2nd, nearly well.]

4. Our next case explains the consequences of ordinary rheumatic fever, for which the patient, Ellen G——, aged 31, was admitted under Dr. Nairne, on the 11th of December, under whose care the foot, which was also affected, has got well; but I was asked to see her about the middle of January, on account of her left knee. At that time she was weak and pale, and exhausted with pain, which was still severe, and was worse and attended with starting in the night-time; she still had some fever, and lay entirely on her left side, with the knee exceedingly bent, and the least attempt to put her into a better position gave her the most excruciating suffering. There was a good deal of swelling, involving all the textures around the joint and lower part of the thigh, without synovial swelling, some parts being more puffy than others, and any pressure of the patella or tibia against the femur gave great pain. In short, the rheumatism had terminated in ulceration of the cartilages of the joint, which was making such progress as to threaten suppuration, but not yet without a chance of its being stopped, and the limb preserved, although necessarily with ankylosis.

She was taking morphia, on account of the nocturnal pain, and some small doses of calomel were given, night and morning, which is of great use in this affection; five or six leeches were applied to the joint about four times, at intervals of two or three days, which considerably lessened the pain; and on the 27th, she was sufficiently relieved to allow of the application of a small blister, which has been repeatedly applied to different parts of the joint, the effect of which I prefer, on the whole, in rheumatic ulceration of the cartilages, to the more energetic remedy—the application of caustic issues, so useful in idiopathic ulceration.

Under these measures considerable progress has been made, and she is now taking better diet, with sarsaparilla and iodide of potassium, but it was not possible, for the first three weeks, to make even cautious attempts to straighten the distorted joint, which you may see still much bent, and the tibia drawn backwards towards the ham, while the patella and femur are proportionately prominent in front. In bad cases there is complete consecutive dislocation into the ham, which is prevented if you can in the first instance keep the limb on a straight ham-splint. In her present state, then, there is great improvement of health and diminution of suffering, and the local

disease is so much better as to leave little doubt of recovery ; but, as I told you that a stiff ankylosed joint is almost inevitable after so much ulceration, what will be her future state? Now, this depends on what she can bear done by an angular splint with a screw, which I ordered a few days ago, with a soft cap over the knee, by which it can be fixed to the angle of the splint, while the screw acts on its two portions. It will require very gradual and cautious use, as the disease would easily be reproduced ; but with caution you can effect a great deal in such cases, before perfect ankylosis is established, and often get the limb in a much more favourable position for walking. [In fact, although the tibia remained permanently somewhat out of the proper line, the knee was got quite straight, and she was walking about with crutches when she left the hospital, early in May.]

5. We will next proceed to a different class of affections of the knee-joint, which are very common. First, let me take the case of Charles B——, aged 14, admitted Feb. 5th, who tells us that in getting off a cart, about six months ago, he strained his knee, which soon swelled, and that he has continued to work up to the present time, though with some pain. The joint has been getting larger lately ; there is some thickening all round it, with some fluid in the synovial membrane, and his general health seems good.

In this boy you see the consequence of a slight injury, which has been kept up by use, and probably would not have been of any consequence but for a tendency to scrofulous disease ; it seemed a mixture of strumous disease of the tibia, with moderate inflammation of the lining membrane. What has been done for him was first to put on a ham-splint, after enveloping the joint in mercurial plaster to keep it quiet, with pressure around it ; and on the 17th, all synovial puffiness having gone, the joint was bandaged up and starched inflexibly. He has also taken some iodide of iron three times a day, and under this treatment you may have seen, when the bandage was taken off on March 3rd, that the joint is quite free from pain and swelling, and he leaves us to-morrow ; but as it has been allowed to go on for six months, I have advised him to continue his gummed bandage for about six weeks longer.

6. In this case you have an early stage of strumous disease, perfectly curable with a little prudence. Our next case, that of Ellen L——, aged 10, admitted on the same day (Feb. 5th), presents us with a much more advanced stage of the same affection, not yet, however, incurable, though it has now lasted seven years, at which time her right knee became affected from a fall down stairs. The joint is swollen so as to measure two inches more than the other knee, the swelling being partly synovial ; this being thickened and elastic, though it probably contains no fluid, but the increase of size chiefly arising from infiltration and organization of lymph in the soft

parts all round the ends of the tibia and femur. The joint is very much bent, without dislocation, and much pain is produced by attempting to straighten it, but yet there is motion enough to show that there is no ankylosis. There has formerly been suppuration, and the cicatrix of the abscess adheres to the inner condyle, but there has been no exfoliation.

In this case there has been strumous abscess connected with the femur, and very probably deposit of cheesy matter in the tibia also, and there has been ulceration of the cartilages, with soft union between the surfaces of the bones, probably of all three, which form the joint. There is also a useless condition of the knee from its bent position; but, fortunately, strumous disease, even of this length of time, seldom causes bony ankylosis, which very soon takes place in such cases as G——'s rheumatic ulceration; and you can, therefore, when the joint is quiet, effect a great deal by means of an angular screw-splint in the ham, which we are using also in G——. I first applied, however, a pair of leather side-splints, to remove entirely all swelling and pain from inflammation, which object you have seen effected; and now you may watch the action of the screw-splint. The girl's health is apparently now tolerably good.

[By the use of the screw the joint was made perfectly straight in little more than a fortnight; and the child left the hospital at the end of March, with orders to wear some straight leather side-splints and a bandage for a long while.]

7. The ultimate consequences of disease of the knee-joint have been shown you in John H——, thirty years of age, whose limb I have been obliged to amputate, and who is going to leave the hospital this week. His disease was probably inflammation of the synovial membrane, followed by ulceration of the cartilages and necrosis of the tibia, in consequence of a strumous constitution, but it may have been originally serofulous disease of the tibia spreading secondarily to the joint.

This man told us that his knee began to swell six months ago, but was cured by blisters, till three months ago, when it again swelled, but was a second time made much better, till three days before his admission, when swelling returned. He has, throughout most of this time, had startings at night and a good deal of pain, and very early in the case an abscess formed below the outer part of the joint, which has never healed. On his admission on the 11th of December last, there was a small opening below the head of the tibia, on the outside, into which the probe passed to some depth, from which there was a watery discharge; there was a good deal of thickening all round the joint, and some fluid within it, which I thought was an abscess, prominent chiefly on the inside of the femur, but communicating probably with the external opening by a narrow sinus; and the man was so weak and emaciated that I told you I could not expect to cure the disease.

You may remember, however, how much relief was at first obtained by rest, by good living, and by saline and opium, followed by calumba and ammonia, and then by quinine; he lost the pain and starting in great measure, and the fluid lessened considerably. In three weeks' time, however, a bad cough came on, with perspirations, and some return of pain in the joint, with evidence of suppurative inflammation within it, afforded by enlargement of the superficial veins of the inner part of the thigh.

At this time, Dec. 30th, I put him under the physician's care for his cough, whose opinion was against the probable existence of tubercles, and on January 23rd, I amputated the limb, at which time the original swelling on the inside had reappeared, and a large separate abscess formed on the outside of the thigh towards the ham. You may remember, that on examination, matter was found in the joint: besides a large foul abscess in the thigh, communicating with it by a small opening, it was found that the original sinus led to a portion of dead bone, the upper end of which was seen in the head of the tibia within the joint, the cartilages of all these bones being in great measure absorbed by ulceration. It is not my intention to notice anything further in this man's case, who is now well; but it is a good example of the effects which may follow disease of this joint, let its origin have been whatever it may; and only amputation can preserve life in such a stage as this, when every texture of the joint is at once affected.

8. In such cases as the two next, it is sometimes difficult to decide in which texture the disease originated, but probably in great measure in the ligamentous tissue around the joint; and such cases as these are sometimes very tedious, and not easily cured, from their tendency to relapse as soon as the patients are allowed to get up and use the joints.

The first of these is Frances H——, aged 31, admitted on the 8th of January; she is a housemaid, and is obliged to kneel much, but there is no evidence of her having had the usual bursal swelling from this cause. She has suffered from pain and swelling of the knee during the last nine months, and has had leeches and blisters applied before she came into the hospital, at which time there was slight general fulness of the parts around the joint, which was tender and painful, but there was no synovial swelling.

Being a nervous person, I first wrapped the joint up in belladonna plaster on leather, with a bandage over it, and gave her steel, and aloes and myrrh pill; but finding that there was distinctly the pain of disease, and not hysterical pain only, I applied a blister on the 20th, and have repeated it three times since that time, under the use of which the joint has much improved, but a little pain and swelling still remain.

After this, the joint was enclosed in leather straps, with mercurial plaster and a bandage, and the patient left, apparently cured, at the end of March.

9. You may see the same affection, in a rather more aggravated form, in the

case of Thomas D——, 37 years of age, admitted on the 8th of January, the same day as the last patient; and in him, also, the disease began about nine months previously, and had, as in her, been prevented from getting well by his continuing to follow his employment. In this circumstance, we see one of the greatest disadvantages which those of all classes labour under who depend on their daily exertions; and it is not wonderful that, when neglected, such cases as these two may sometimes be seen to terminate, notwithstanding their present chronic condition, in ulceration of the cartilages and a succession of small abscesses, and, finally, in the loss of the limb.

It appeared, from his account, that nine months ago pain came on in his knee without any apparent cause, followed in about a fortnight by some swelling; that a blister on each side of the joint relieved the pain, but the swelling continued; that two months ago he came here as an out-patient, and that some more blisters had reduced the swelling and lessened the pain; but that all this time he had continued to go about as a carman.

On his admission there was a good deal of pain, increased by using the joint, and there was puffy swelling and hardness round the joint, with considerable stiffness; but there was no synovial enlargement, and none of the starting of diseased cartilages. He has therefore had a succession of several blisters to his knee, and our notes tell us that the knee is in all respects better. I do not consider him, however, by any means cured; and he will probably require rest, either in bed, or by means of splints, for a long while, and when allowed to use the joint again he must exercise the greatest caution.

In such cases as these you require several measures to get rid of the thickened condition of the soft parts, on which the stiffness depends; of which, iodine lotion, or hydrochlorate of ammonia lotion, or local vapour baths, or shampooing, or affusion of water from a height, as from a pump or douche, are the best.

[This man continued to get better till he went out, on April 9th, and as the swelling subsided it became evident that there was thickening of some parts of the synovial membrane, feeling like semi-cartilaginous masses moveable with the membrane to which they were attached.]

10. The last case I invite you to observe, is that of a girl named J——, but I have only time to allude to it, as illustrating a not infrequent joint affection, in which, with the most severe pain, so that she cannot bear to be touched or moved, there is yet no real disease; it is hysterical pain only of her hip and knee of a very aggravated kind, depending on her general health. At the same time, never forget that acute hysterical pain is often added to real disease, so as to mask and conceal its symptoms; and let your proceedings be cautiously directed, lest you increase the primary affection by that exercise of the joint which the hysteria would require, if alone.

[*Lancet*, August 16th, 1851.]

CLINICAL REMARKS

ON

SOME DISEASES OF THE ANKLE JOINT.

1. Inflamed Bursa of Tibialis Anticus.—2. Caries of Tibia and Fibula, and Diseased Ankle-joint.—3. Enlargement and Union of Tibia and Fibula—Anchylosis—Caries.—4. Medullary Disease of Ankle and Leg.—5. Disease of Os Calcis, Femur, and Cranium, resembling Carcinoma.

I PROPOSE first to bring under your notice three cases of disease of very different character, but associated together, as being all situated about the ankle-joint.

1. The first is the case of Ann Duff, 21 years of age, admitted on the 28th of December, in whom pain came on in the ankle six or eight months ago, with swelling and weakness. Previously to her coming in, a medical man had cupped her; but she had only laid up for one day, so that the pain cannot have been very acute. On her entrance, there was some swelling below the inner malleolus, smooth, and containing some fluid, and very tender. Was it, then, an inflamed ankle-joint, as some supposed?

Inflammation of a synovial membrane requires that the swelling should be of the form of the membrane itself; in the ankle-joint, therefore, you perceive a puffy swelling in the front of the joint, below the extensor tendons, from one malleolus to the other; the lateral ligaments prevent much swelling at the sides, and therefore you see none on the inside, and not much on the outside; the membrane is not restrained behind, and therefore you can feel a puffy swelling beneath and on each side of the tendo Achillis above the heel. But there was nothing of this in our patient, whose swelling was of an oblong shape, about two inches long, beneath the inner malleolus; and it appeared, therefore, to be an enlargement of the bursa of either the tibialis posticus or extensor communis digitorum, and most likely of the former, as it was quite close to the bone.

Cold lotion was applied till the cupping marks had healed, and haustus quinae was prescribed. Then a blister was ordered, which was applied, by mistake, over the tibia, instead of over the swelling; but, being close to the swelling, it was somewhat lessened; and, a second blister being applied, the note of the 23rd of January says that the fluid is entirely absorbed. The tenderness is not quite gone, and the use of the tendon must be restrained by strapping or bandage, to prevent the return of the swelling,—particularly as she is weak and hysterical; and to-day I found her weakened still further by an attack of diarrhoea, which began a day or two ago.

The enlargement of a bursa about a joint, sometimes bears much resemblance to inflammation of the joint itself; for example, when the bursa of the psoas magnus inflames, it is not easily detected by one who is not

aware of this affection. The bursa, in this particular part, is not often inflamed by itself, but sometimes, in a serofulous person, you will see a very considerable enlargement about the ankle-joint in connection with all the flexor and extensor tendons at once, lasting for years together. Do not forget the bursæ around every joint however, for many of them are in close contact with synovial membranes, even when there is no actual communication between the bursa and the joint, and, therefore, inflammation excited in a bursa readily spreads to other bursæ, or to the synovial membranes, which are in contact with them. The numerous bursæ about the shoulder-joint especially become, when in a state of inflammation, the source of formidable, and even fatal inflammation of the joint. Sometimes also strumous deposit and chronic abscess of a bone close to the insertion of a tendon, look like enlargement of the bursa of the tendon, and such might be the appearance here, if the astragalus or os naviculare were carious.

When a joint is acutely inflamed in a healthy person, either after an accident or disease, such as rheumatism, there may take place complete ankylosis, as you may see in this ankle-joint (on the table), in which no trace of the original cartilaginous surfaces is left.

Again, if inflammation takes place in an unhealthy person, you may find the usual evidences of serofulous disease, which this ankle-joint (on the table) shows you, increased vascularity, partial ulceration of cartilages, abscesses in various directions, leaving sinuses through which a probe enters the joint, with thickening of all the soft tissue around it.

2. But, thirdly, there are certain forms of disease of a mixed character and of rarer occurrence, in which the bones of the leg are inflamed, thickened, become carious or necrosed, without evidence of strumous constitution, though chronic; and so originating, the joint of the ankle may become secondarily diseased, giving rise to various complications, and often becoming of serious consequence to the life of the sufferer. Of this mixed character, is the case of Charles Stanley, 64 years of age, admitted on the 30th of November. His history is, that a year before, he had struck his leg against a step, on the inside, about three inches above the joint, making a wound, which soon healed, but remained adherent to the tibia; that about five months ago a gathering formed on the outside, close to the fibula, and soon afterwards an abscess formed in the cicatrix on the inside, and that both openings had discharged ever since, and that he had considerable pain about the ankle before the abscesses formed. On his admission, the lower part of the leg was inflamed and swollen, and the skin red and tense. The probe felt exposed bone on the tibia, which was probably dead, but not loose; and on the outside it touched the fibula, but no bone seemed dead, though it might be carious; and from this opening the probe passed completely across the front of the joint beneath the extensor tendons, and its end

could be felt near the skin, just in front of the inner malleolus ; but as there was no swelling or pain behind the joint, it was not certain whether the synovial membrane was penetrated by the probe, or whether it passed in front of the joint. Both openings, it was afterwards ascertained, communicated with one another. The fluid which came from the inner opening, resembled synovia ; but so it might do if the suppuration came from the bursæ of the tendons.

After a little while, the inflammation subsided, and on the 9th of December, it is stated, that the wounds were healing. To lessen the swelling below the tendons, and keep the joint quiet, and assist in healing the openings, if the state of the two bones allowed of it, some strapping and bandage were applied, but this plan was not continued long, as it seemed to close the openings too much, and confined the pus. Still the limb appeared to be going on well, and his health improving, till the 9th of January, when he had some chilliness, though no distinct rigors ; his foot and ankle, and the lower part of the leg, became swollen and red, without inflamed absorbents, or erysipelas, and his manner became excited, with a red and dry tongue, and quick, weak pulse, and the pain kept him awake for several nights. Under opium and chloric æther, and wine with salines, and subsequently bark with opium, he became better, and the inflammation and swelling subsided ; but he remains in a precarious state of health, with considerable pain, and the joint apparently communicates with the abscess, even if it did not do so at the time of his admission ; and a cough, to which he is subject, has been more troublesome for the last three weeks, though probably only from bronchitis.

With such a combination of disease of both tibia and fibula, and of the ankle-joint, in a weak man of advanced age, there seems scarcely any chance of saving the limb, by procuring healthy ankylosis, and a cure of the apparent caries. But then, on the other hand, an amputation at his age, and in such a state of health, would be very hazardous, for he is just in the most favourable condition for the occurrence of secondary hæmorrhage, or for foul suppuration in the stump, and secondary abscesses. On the whole, therefore, I am inclined to postpone such a course, and endeavour to improve his state of health, if the limb does not admit of improvement, at least till it is certain, of which I am not quite assured at present, that the irritability of his system depends on the pain of his ankle.

[On February 3rd, some fresh swelling and inflammation showed themselves about the ankle. On the 4th he had rigors, which occurred again on the 5th in the morning ; after this he ate his dinner as usual, and had his tea and his wine. About nine in the evening he again had rigors, and fell into a state of partial coma, from which he did not rally, and died yesterday morning, the 6th. Many of you have seen that both tibia and fibula were

exposed, and slightly carious at a little distance from the joint; that both sinuses communicated with each other, and led into the joint, the cartilages of all the articular surfaces being entirely destroyed, and foul pus passing from the joint to the external openings, the bones in the joint being black and eroded. Besides this, a collection of thick white pus had formed behind the joint, not yet communicating with it, and probably very recently collected. The femoral and external iliac veins contained soft discoloured blood, such as is seen in phlebitis, from softened fibrin; and then, near the latter vein, the whole length of the *psoas magnus* muscle above Poupart's ligament was soft and discoloured on the surface, and, when cut into, showed a quantity of purulent deposit among the muscular fibres, which were not yet broken down so as to form an abscess, as they would have done if the patient had lived a little longer. I can scarcely doubt, that if amputation had been performed, phlebitis would also have occurred from the stump; if, indeed, it had not begun at the time some irritative fever took place, about a month before his death.]

3. But different states of the limb may occur in these complicated cases. When both of the bones of the leg are inflamed, and the ankle-joint is at the same time diseased, such a condition may be produced as you see in two preparations on the table. In the first of these, the patient's constitution must have been tolerably healthy, for you see that there is complete ankylosis of the articular ends of the tibia and fibula, and four inches above the joint, a mass of new bone has been thrown out, which has entirely joined the bones together for some distance, the osseous deposit obviously reaching from the one to the other, where the interosseous ligament formerly joined them; and the appearance of the bones is such as seems to show, that all disease must have stopped for some years before the patient's death.

In the second, however, you see a great mass of new bone, with much enlargement of both tibia and fibula through their whole length, by which they are irregularly, but entirely joined together, so that you might think you were looking at a single large bone, hollowed out in different parts to a great depth by caries, and loss of substance from necrosis or surgical operation, the disease extending, as you may perceive, quite down to the articular ends of the bones in the ankle-joint. I took this from a patient who was in the hospital when I was house-surgeon, and the limb was not amputated, as the time seemed to have gone by, for the patient was dying of general dropsy. Now in this case you can easily understand to what a size the diseased limb must have reached, when you look at the circumference of the two united bones in their dry state; in fact, what with effused and organized solid lymph in all the soft textures of the leg, and œdema added to this, it was very much enlarged and misshapen, as in elephantiasis of the leg.

4. Having made these observations, let us now proceed to the case of James Lear, 21 years of age, admitted on the 30th of last month (December). It appears the disease began, according to his account, after he had made a long journey on foot, about six months ago, soon after which it began to swell and become painful on the outside, as if about the lower part of the fibula. In this situation were two flat prominences, like hard fibrinous tumours of the cutis, both of which seemed to be over the bone—one of which was about half an inch high, and an inch and a-half in diameter, and the other somewhat smaller. They were hard, and redder than the adjacent skin; but when the blood was pressed out of the vessels, their colour was yellower than healthy skin. In other parts the skin was not altered in texture or colour. The whole of the lower third of the leg, including the level of the joint, was enlarged, as if deeply-seated matter might be forming; the front of the leg and the anterior surface of the tibia were not swelled, but the swelling seemed to travel from the outside, behind the leg, to the inner margin of the tibia. At the back part and the inner side the swelling was hard, but all the upper part was soft and elastic, and the foot and leg around the swelling were somewhat œdematous. The patient had been living well on meat and two pints of beer; his appetite was good, and his tongue clean, but yet he said he had been getting thinner, and looked pale and anxious from pain.

I first placed the limb on an inclined plane to get rid of the œdema, the subsidence of which showed the tibia more completely to be of its natural size, but the general swelling remained as it has just been described, and the pain was not much lessened. What, then, was its nature?

There was certainly considerable obscurity, especially from the hardness on the back part, and the flattish projections on the outside; but, on the whole, I was inclined to treat it as disease of the fibula, spreading probably to the joint, and producing a large collection of thick pus in the back of the leg, covered by much thickening of subcutaneous tissue, like that which accompanied the last case I have mentioned. I therefore applied a blister to the outside, and afterwards to the inside, and gave the patient each night soap pill with opium, to allay the pain he suffered from, with some colocynth, to prevent constipation from the opium. On the 20th, the notes say that the swelling was softer, and not so painful. Still, however, the swelling was spreading higher in the leg, and, although soft and elastic, there was no distinct evidence of fluctuation, or of fluid. On the 27th, therefore, four days ago, I punctured the upper and softer part of the swelling with a grooved needle, but nothing appeared to come out but blood. I then punctured the largest prominence, where the disease seemed to have commenced, but with no other result,—soft, solid matter occupied both places. I

now inquired about the glands in the groin, which were not enlarged on his admission, and found two masses of enlarged glands divided from each other by a band of *fascia*, one of them of the size of a small orange, and consisting of several glands joined together, the growth of which, he said, he had noticed for about a month, but which he had not mentioned, as he had felt no pain in them, and therefore had not supposed that they were of importance.

Yesterday, the 30th, he complained of increased pain in the swelling, and I changed his pill for some *liquor opii sedativus*, to be taken every night.

Now, then, there can be little doubt that the swelling of the leg is formed by a medullary tumour, which, perhaps, began from the fibula, and has since spread upwards and around the leg among the deeper textures. Such a growth, in the neighbourhood of a joint, is not unfrequently very obscure, from the manner in which it spreads irregularly in different directions, according to the degree of pressure it is subjected to in different parts, and according to the textures involved in it as it spreads, being softer among the muscles, where little resistance is afforded to the growth, and harder where it is below *fasciæ*, or tendons, or ligaments, and where these tissues are involved in the tumour.

I need scarcely say, that, on this supposition, the result of to-morrow's consultation can only be that amputation is not to be recommended, since the glands are so much enlarged, and it is of no use whatever dissecting out the absorbent glands when poisoned in cases of *carcinoma*; if all which now appear were removed, it would be almost certain that others not now apparent would subsequently show themselves. The only circumstance which could justify such risk as an amputation involves, would be a state of greater suffering than at present, with ulceration and hæmorrhage, in which state of things the removal of the diseased limb sometimes palliates the patient's condition and prolongs his life.

5. But supposing that no abscess exists, is there nothing whatever besides medullary disease which could produce such a mass of solid materials as in this case? We have seen that a kind of growth, like elephantiasis, may be the consequence of long continued inflammation of the bones; and such is just possible, but in the highest degree improbable; and it is exemplified in these two preparations of a foot which I amputated; and the case is very interesting from its showing you the anomalies which you must expect to meet with occasionally in practice, and I will, therefore, read a brief account of it.

A woman, 28 years of age, was admitted Dec. 2nd, 1840, having had pain and swelling about the ankle for seven years; an incision had been made

into a growth of considerable thickness seven months before her admission, but only blood escaped, and the opening had never healed since. There was much solid enlargement about the joint, with a deep irregular ulcer on the inside, and excessive pain on motion of the limb. Amputation was proposed in January, but was declined by the patient. The ulcers spread, and their surface and the adjacent skin assumed a warty appearance, with much hardness, and had very much the appearance of cancer, as, indeed, you may still see in the preparation. In February a mass of glands of considerable size formed in the lower part of the groin, and in April a soft tumour appeared on the inner condyle of the femur, evidently growing from the periosteum. In May the mass of glands sloughed out without previously suppurating; the surface healed; but in June another mass formed, as large as an apple, nearer to the groin, and went on sloughing slowly for several weeks; and in this month a tumour formed in the forehead by apparent expansion of the outer table of the bone with a central aperture, in which soft substance could be felt in the diploe, not fluid, attended with much pain, and with yellowness of countenance and failing health.

Could any case possibly bear more resemblance to cancer? and, with such a combination of symptoms for several months, it is no wonder that I did not accede to the wish she now expressed for the amputation of her excessively painful leg.

In September, however, the use of sarsaparilla and iodide of potassium began to have the effect of lessening, and finally removing the tumours of the cranium and femur, and healing the sore left by the sloughing glands; and, in November, I amputated the leg below the knee, with the hope that, notwithstanding so many suspicious appearances, the bones might possibly be affected only with serofulous disease, though of very unusual character.

In the notes of the dissection, it is thus described:—"There was much condensation of the skin and subjacent tissue, resembling that of cancer, with warty growths, also like cancer; there was partial ulceration of the cartilages of the tibia and astragalus, and partial ankylosis of the astragalus and os calcis; and in the centre of the os calcis was a portion of dead bone infiltrated with pus, and with surrounding inflammation, but with scarcely any effort at separation, as you may see best in this thin section of the bone.

The notes say, that she was quite fat and well in July, 1842, without any trace of the tumours of the condyle and frontal bone; and I have reason to believe that she continued well for several years at least, though I have not heard of her for some time; so that certainly, beginning as caries of the os calcis, the result of the medical treatment and of the amputation

appears to show that, however anomalous and extraordinary in its progress the case had been, the other parts of the disease continued to possess the same character of struma. I wish I could think it might also be so in our present patient Lear ; but I fear it is only barely possible.

[*Medical Times*, March 18th, 1854.]

T H E E N D.

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